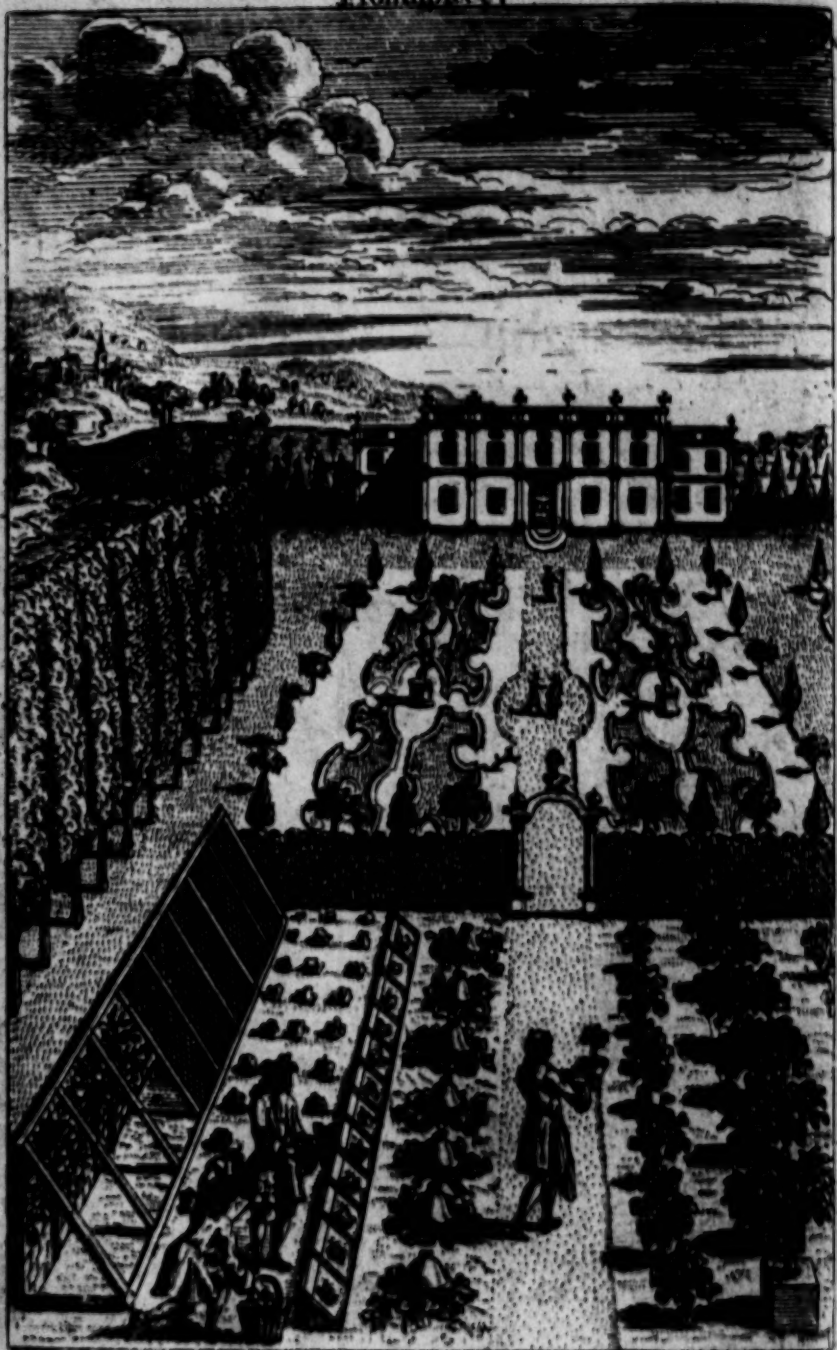
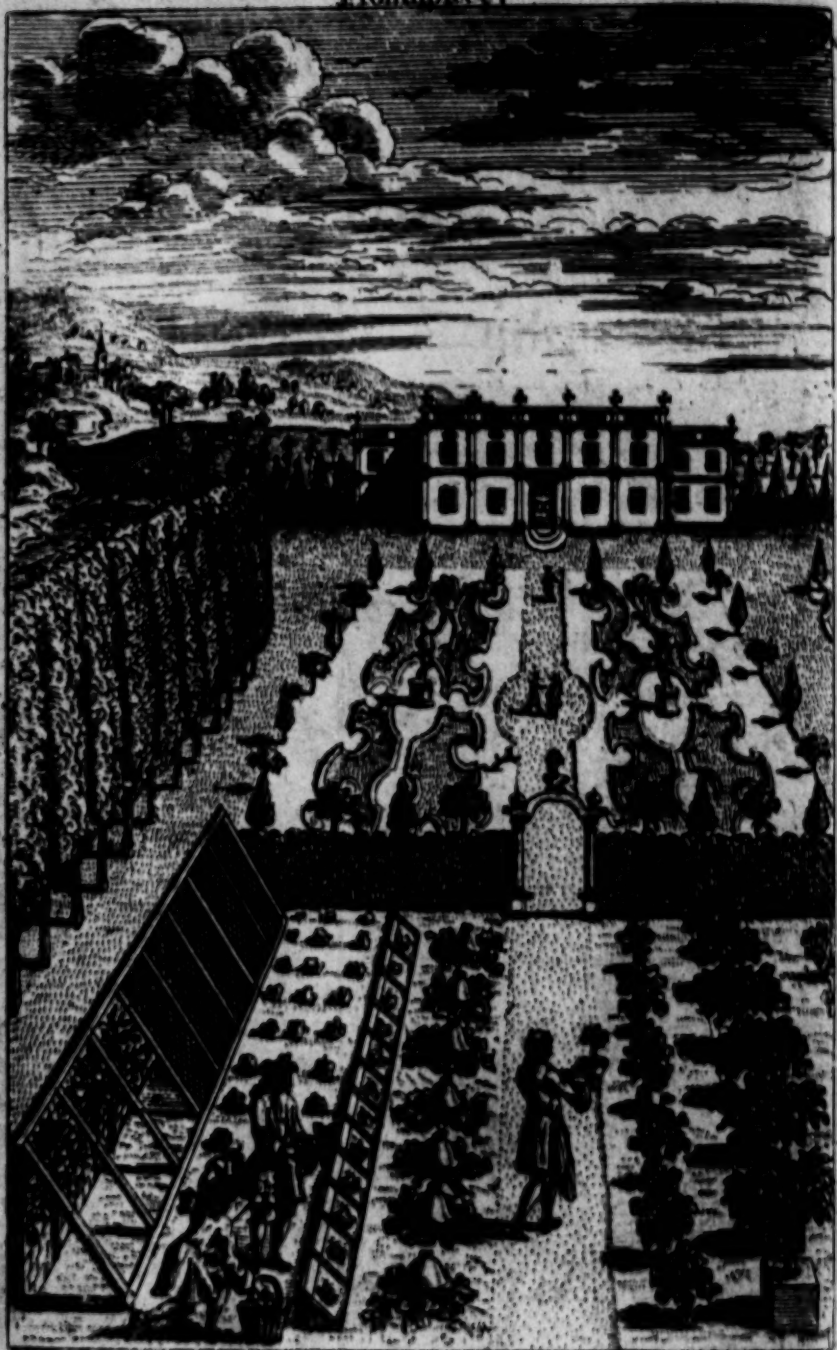


Frontispiece.



Frontispiece.



820

NEW
IMPROVEMENTS
OF
Planting and Gardening,
BOTH
Philosophical *and* Practical.

In THREE PARTS.

- I. Containing, A *New System of Vegetation*. Explaining the *Motion of the Sap, and Generation of Plants. Of Soils, and the Improvement of Forest-Trees.* With a new Invention, whereby more *Designs of Garden Plats* may be made in an Hour, than can be found in all the *Books of Gardening* yet extant.
- II. The best Manner of improving *Flower-Gardens or Parterres*: Of Raising and Propagating all Sorts of *Flowers*; and of the Adorning of *Gardens*.
- III. Of Improving *Fruit-Trees, Kitchen-Gardens, and Green-House Plants.* With the *Gentleman and Gardener's Kalendar.*

To which is added, that scarce and valuable TRACT, intitled,
HEREFORDSHIRE-ORCHARDS.

Agite, O Adolescentes, & antequam Canities vobis, obrepat, Stirpes jam alueritis, quæ vobis, cum insigni utilitate, delectationem etiam adferent. P. Bellon. de negl. Stirp. cult.

The SEVENTH EDITION, with an APPENDIX, treating
of several Matters omitted in the former Impressions.

Illustrated with COPPER-PLATES.

By RICHARD BRADLEY, late Professor of Botany
in the University of Cambridge, and F. R. S.

LONDON:

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M.DCC.XXXIX.

13

W. Shawe.





To the Most High, Puissant, and Most
Noble PRINCE

HENRY,

Duke, Marquis, and Earl of *Kent*, Earl of
Harrold, Viscount *Goodrich*, Baron *Lucas*
of *Crudwell*, &c. Lord-Steward of His
Majesty's Household, Constable of *Windsor*
Castle, and Lord-Warden of *Windsor*
Forest, Lord-Lieutenant, and *Custos Ro-*
tulorum of the County of *Bedford*, one of
the Lords of His Majesty's Most Honou-
rable Privy-Council, and Knight of the
Most Noble Order of the Garter.

My LORD,



O U R Grace's Generous
Encouragement of what-
ever may advance the
Good of your Country,
gave me the first Thought of in-

A 2

scribing

The Dedication.

cribing these Papers to your Great Name; and it is with Pleasure that I mention your Grace's Permission to make Use of that Patronage which my Ambition led me to. I am too well acquainted with your great Attainments in all kinds of Learning, to offer any conjectural Projects, or vain Hypotheses, to so penetrating a Judgment; these Sheets are the Result of many Years Experience, the only Foundation which such accurate Philosophers as your Grace will allow for the Improvements of Natural Knowledge. It is a great Happiness when Men of your exalted Quality and large Fortunes honour the Sciences, not only with your Protection, but by being Masters of them, become their Ornaments. Thus, my Lord, you are to our Studies, in a way

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way of Art, what the *Sun* is to the Subject of them in a natural way, which though placed at infinite Distance from the *Plants* of the *Earth*, yet by its Influence, gives them Warmth, Action, Life, and Beauty.

May it please your Grace,

Instead of enumerating the several Virtues of your Illustrious House, and your own, which the Publick know already; I beg leave to congratulate my Country, upon the noble Spirit your Grace has always shewn in doing it the most important Services. The Men of Business, and the Men of Letters, the *State*, and the *Society* of Learning, are equally your Debtors. For my own Part, though the meanest among the latter, I shall endeavour, from your

The Dedication.

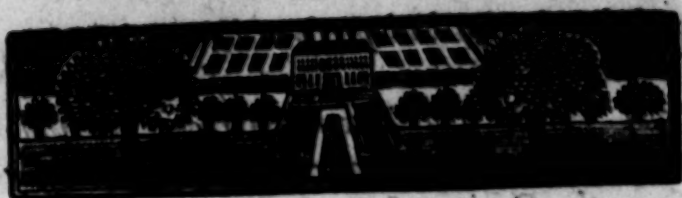
Influence, to prosecute the Subject I
have here begun with new Vigor,
humbly hoping to approve myself
what I most desire to be thought,

Your GRACE'S

Most Obliged, and most

Obedient Humble Servant,

Richard Bradley.



THE
PREFACE.



S there is no Subject of more general Use and Advantage than the Cultivation of Land, and the Improvement of the Vegetable World; so there is none which has been treated of more largely, and fallen under such Variety of Pens of all kinds. The Publick, which is generally so good-natur'd on this Occasion, as to accept and encourage any thing that looks towards the bettering their Fortunes, has never been so much hault'd in their Expectations as in Books of Agriculture. The Reasons of which are, that some of these Writers have bestowed their Pains in collecting from Antiquity and Foreign Soils,

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and thought they had perform'd great Matters; by heaping together a Load of Observations from Varro, and Pliny, without carefully considering wherein their Experiments differ from the Genius of our Soils and Climates. Others have employ'd their time in copying from our old English Systems; and these have generally transcribed one another without the least Acknowledgment of their Thefts, or adding one single Improvement to the Knowledge of their Forefathers: And indeed, how should it happen otherwise, when the Undertakers of this Subject have either been covetous or illiterate Gardeners and Planters; some, that if they knew any thing new or curious, had not the Spirit to communicate their Notions; and some that jogged on in the old beaten Track, without any Ambition to excel their Predecessors? We have now and then, it is true, a Gentleman studious and capable of obliging the World, free from the narrow Views of Self-Interest, and employing his Hours for a more diffusive Benefit than the Culture of his own private Estate or Garden; an Evelyn, a Nourse, and a Lawrence, have given us something equally new and just, built upon Experiment, upon the beneficial Subject of Plantation: But what are these, when

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when compared to that useless Number of unimproving Authors?

Apparent rari nantes in gurgite vasto.

For my own Part, I must confess that I have been a long time waiting for a Compleat System of Agriculture, and have read many a fair-promising Title, but have found nothing within but a barren Bulk of old Repetitions. This has excited me, who, from a natural Bent of Genius, even from my Childhood, have had a Passion for Gardening and Planting, to reduce all my Notions and Observations into a regular Form, and endeavour to supply this general, and so much lamented Defect of other Writers. I shall think, without Vanity, that I may do my Country no inconsiderable Service, if I can excite the Nobility and Gentry of the Kingdom to early Plantations upon their Estates, which, I shall prove, will not only redound to their own private Profit, but the Advantage of the Nation in general. The Disuse of this Method was complained of by Mr. Evelyn, who says very justly, There is no Part in Husbandry which Men commonly more fail in, neglect, and have cause to repent of, than that they did not begin
Planting

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Planting beſimes. And indeed ſuch Perſons who have been deaf to Demonſtration at the firſt Poſſeſſion of their Eſtates, and are afterwards convinced of the vaſt Advantages to be reaped by an early Plantation, either from the Experience of their Neighbours or themſelves, muſt have a very pungent Retroſpect upon this Occaſion. Every Man is naturally willing to enjoy the Profits of the Works (as one may call them) of his own Hands; and he therefore who begins at Fifty to be ſenſible that he has loſt many a fair Thouſand by his Neglect of improving his Eſtate between Twenty and his preſent Age, is to himſelf indeed a Loſer, but a Warning to others to avoid that Folly.

To begin then as methodically as I can, and take in all that relates to this Subject, I ſhall fairly tell my Reader what he is to expect in the following Sheets; and I hope he will pardon me if I mix a little Natural Philoſophy, ſuch as is plain, eaſy, and grounded upon my own Experience, with theſe Obſervations on Gardening and Planting.

*I ſhall then advance (what I think) a new System of Vegetation, and endeavour to prove that the Sap of Plants and Trees circulate
much*

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much after the same manner as the Fluids do in animal Bodies; which may be one Argument to shew the beautiful Simplicity of Nature in all her Works.

The Generation of Plants will next be consider'd, and the manner how their Seeds are impregnated; a Discovery which I made some Years since: This will be of great Use to all Planters, by directing them in the proper Choice of their Seeds.

The Difference of Soils will make another considerable Article, what are natural to each Tree, and how all Kinds of Soils may be mended, alter'd, or improv'd, by proper Mixtures with each other; a Part of Husbandry that has yet been but slightly touch'd upon, and yet the Whole depends chiefly upon it.

The Method of dressing of Woods, and making Plantations of Timber-Trees, naturally follows; wherein I shall propose a new, easy, and practical Way of raising Woods with very little Expence; which I hope will take off those Fears which the Generality are taught to conceive of the present great Charge of New Plantations.

And

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And for the farther Encouragement of all Gentlemen, who propose an Advantage from their Woods, I shall add an Estimate of the Profits that will arise from an Acre of Land planted with Timber and Underwood in Nine Years, Seventeen Years, and Twenty-five Years after planting; which I shall prove will amount to above 260 l. beside the Timber growing.

I shall then enter the Flower-Garden, and prescribe the properest Methods for rendering that Part ornamental. In the first place, my Reader will find the Description and Use of my Invention for the more speedy Drawing or Designing of Garden-Plats; and I am of opinion, that when he once understands the right Use of it, I shall have thanks for that Discovery.

*I have there given the best Method of Propagating and Introducing all the Ornaments of a Garden, as Ever-greens, Flowering-Shrubs, Perennial and Annual Flowers, and Bulbous-rooted Plants, with their different Heights, Beauties, and Times of Flowering. By these Means a Garden may have
always*

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always something entertaining in it, while a successive Scene of Delight is kept up by a due Regard to the peculiar Season of each Flower.

There is one Particular which relates to this Subject, that could be no where so well introduced as here, i. e. the general Irregularity and Inconsistency of dead Ornaments in Gardens. I shall only hint at a few. Iron-Works are often placed where there are no Prospects. We see many large Statues in small Gardens, and a few small ones in large Gardens. The Misplacing of Ornaments in Gardens is another Fault, which is sometimes so absurd, as to equal the mismanaged Picture in Horace:

*Delphinum Sylvis appingit Fluctibus
Aprum.*

*Thus we view a Neptune in a dry Walk,
and a Vulcan in the Middle of a Fountain.*

These are so shocking to common Sense, that I think it sufficient only to take a cursory Notice of them, to make them avoided.

In

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In the next place, I am led to prescribe such Rules as are necessary for the Propagating and Managing of Fruit-Trees, as well against Walls as in Standards; and from thence proceed to lay down necessary Instructions for the ordering the Kitchen-Garden; and conclude, with directing the Culture of Orange-Trees, and tender Exotic Plants. To which I shall add, the Gentleman and Gardener's Kalender; wherein I have given, in a particular manner, some necessary Instructions for the Building of Green-Houses.

Some very curious Gardeners, out of a Desire (as I suppose) of improving themselves in the Knowledge of Nature's Works, have objected against one Thing in particular, mention'd in my New Improvements, Part I. pag. 6. which relates to the Budding the Striped Jessamine upon the common Sort, and by that means making the whole Plant, or many Parts of it become striped, from the unwholesome Tincture communicated to the Plant from the striped Bud. This, they affirm, is not so as is related either by Mr. Lawrence, or myself; but I conceive their Objection rather proceeds from the Desire they have to be convinced of the Certainty of the Thing,

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Thing, than from any Ill-nature: Therefore, that I may not be wanting to them to give full Satisfaction of the Truth of what is alledg'd relating thereunto by the worthy Gentleman above-mention'd, as well as what I have also affirm'd concerning it, I refer them to the Garden of the ingenious Mr. Whitmill at Hoxton; where they may be Eye-witnesses of Plants now growing, of the Common White Jessamine, which are variegated by the same Means, and after the same Manner, as is related in the Clergyman's Recreation, and my Book of Gardening.

Having now laid my Scheme before the Publick, I shall conclude this Preface with taking notice of the Indiscretion which too many are guilty of, when they walk in fine Gardens, in gathering of Flowers and Fruits unskillfully; which proves oftentimes prejudicial, either in the Loss of the Seed of a good kind Flower, the Loss of an Experiment, perhaps, or a Damage to the Tree the Fruit is torn from: And I the rather mention this publickly, because many Gentlemen, who have fine Gardens, have often complain'd of this Breach of good Manners in their Neighbours, without being capable of redressing the Grievance they lay under. I am sure no body can reasonably
take

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take this amiss from me, since every one must needs be sensible, this Inadvertency has many times destroy'd a valuable Plant, and given Uneasiness to a good Friend. This, I think, is a necessary Conclusion, seeing that all our Expence and Pains in making Gardens may be render'd fruitless, if such Indiscretions are continued.



NEW



NEW
IMPROVEMENTS

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CHAP. I.

*A Parallel between Plants and Animals; with
an Attempt to prove the Circulation of the
Sap in Vegetables.*



VEGETATION, in whatever
degree I shall treat of it, is equal-
ly depending on the Order of Na-
ture. Whether I speak of *Trees,*
Shrubs, or *Herbaceous Plants,* their
Principles are equally the same;
that is to say, they all alike draw their Nou-
rishment by way of their *Roots*: Which Nou-
PART I. B rishment

ishment is convey'd through proper Vessels into the *Stem*, the *Branches*, *Leaves*, *Flowers*, and *Fruit*.

Now, that I may more easily explain by what Means every *Plant* receives and distributes its Nourishment to the several Parts of it, give me leave to draw a Parallel between *Plants* and *Animals*; that thereby the Nature of *Plants* may be the better understood.

The many curious Observations which have been made concerning the Structure of *Animal* Bodies, and what *Malpigi*, Dr. *Grew*, and myself, have remark'd in the Structure of *Vegetables*, may ascertain to us, that Life, whether it be *Vegetable* or *Animal*, must be maintain'd by a due Circulation and Distribution of Juices in the Bodies they are to support. We have all alike discover'd (with the help of *Microscopes*) the several Vessels and other Parts which compose a *Plant*; but I cannot agree in opinion with the Authors I have mentioned, concerning the Course of the Juices through the Duets and Channels which we have discover'd. It would be needless for me in this place to relate their several Opinions, which would swell this Treatise to too great a Bulk; their Works may be perus'd by the Curious. I shall proceed to explain, that the *Sap* circulates in the Vessels of *Plants*, much after the same manner as the *Blood* doth in the Bodies of *Animals*.

And that this new System may be the better understood, I think it proper in this place to give a short Description of the Vessels in *Plants*, and their Situation. First, then, the *Root* of a *Plant* is of a spongy Nature, ready to admit into it such humid Particles as are fitted (in the Earth by a certain Temperature of Air) to be received into its Pores: And we may observe, that the various Qualities of different *Plants* depend chiefly

on the different Size of the Pores in their *Roots*, by which they receive their several Nourishments.

Secondly, We must understand that the Wood of every *Plant* is composed of capillary Tubes running parallel with each other, from the *Root* (upright) through the *Trunk*. These Cavities are generally so small, that they are hardly to be discern'd by the natural Eye, unless in a Piece of Charcoal, Cane, or Oaken Board. These Vessels renew and augment themselves every Year; as we may observe by cutting a Tree horizontally, which will discover to us the latitudinal Shootings, and the annual Additions of these Pipes, and for which reason the *Trunks* of Trees increase in their Circumference. These Tubes, for Distinction sake, I call *Arterial Vessels*; For it is through these the *Sap* rises from the *Root* in fine *Vapour*; for their Cavities are so small, that it would be impossible they should admit any thing, whose Parts were so large as those of a *Liquor*.

Thirdly, The Passages or Pipes, by which the *Sap* returns downward, are much more open than the former, and are capable of receiving a *Liquor* into them. These are placed immediately on the Outside of the *Arterial Vessels*, between the *Wood* and inner *Bark*, and lead down directly to the Covering of the *Root*. They perform the Office of *Veins*, and contain the liquid *Sap* which is found in *Plants* in the Spring and Summer Months.

Fourthly, The *Bark* of a Tree is of a spongy Texture, and by many little Strings which pass between the *Arterial Pipes*, corresponds with the *Pitb*. These Pipes are so interwoven with one another, that they form a sponge-like Body, which together imbibes the Air, and thereby nourisheth the Vessels of the *Plant*, and keeps the

the whole Body in Health: And that this is the Use of this spongy Body, is certain; because when we keep a *Plant* in a close Place, or exclude the Air from it, it soon languishes, and turns pale, and makes small Shoots; which are certain Signs of Sickness.

Fifthly, The *Pith* is composed of little transparent Globes chain'd together in like manner with those Bubbles which compose the Froth of any Liquor.

In fine, a *Plant* is like an *Alembick*, which distills the Juices of the Earth.. As for Example:

The *Root* having suck'd in the Salts of the Earth, and thereby fill'd itself with proper Juices for the Nourishment of the *Tree*; these Juices then are set in motion by the Heat, that is, they are made to evaporate into *Steam*, as the Matter in a Still will do when it begins to warm. Now, as soon as this *Steam* or *Vapour* rises from the *Root*, its own natural Quality carries it upwards to meet the Air; it enters then the Mouths of the several *Arterial Vessels* of the *Tree*, and passeth up them to the top, with a Force answerable to the Heat that put it in motion: By this means it opens (by little and little, as it can force its way) the minute Vessels which are roll'd up in the *Buds*, and expand them by degrees into *Leaves*. Thus when we give a forcing Heat to the *Root* of a *Plant*, it grows quicker than when it has only a moderate Heat.

But as every *Vapour* of this kind, when it feels the Cold, will condense and thicken into a Water; so when the *Vapour* which I mention to rise through the *Arterial Vessels*, arrives at the extreme Parts of them, (i. e.) the *Buds* of a *Tree*, it there meets with Cold enough to condense it into a *Liquor*, as the *Vapour* in a Still is known to do.

In

In this form it returns to the *Root* down the *Vessels* which do the office of *Veins*, lying between the *Wood* and inner *Bark*; leaving, as it passeth by, such Parts of its Juice as the Texture of the *Bark* will receive, and requires for its Support.

It may be wonder'd at, that I have not taken more notice of the *Pith*; which has been always accounted the principal Part of a *Tree*: To which I shall only answer at this time, that many *Herbaceous Plants* have not any *Pith*; and that I have seen the *Trunks* of large *Trees* destitute of it, and they have yet continued to grow, and to bear *Fruit*; so that the Order of *Vegetation* may be explained without it. And indeed, was I here to take notice of the several Particulars in *Plants*, I might swell this Treatise into a large Volume: But I am clearly of the same opinion with him that said, *μὴν ἄλλοιον, μὴν ἄλλοιον* and therefore shall confine myself in this Work to such Relations only as I hope may be useful.

But to proceed: The following Experiment of the most ingenious Mr. *Lawrence*, which he has mention'd in his *Clergyman's Recreation*, relating to the *Jessamine*, may convince us of the Certainty of the *Sap's* Circulation in *Plants*. I shall give it in his own Words: " Suppose a plain *Jessamine-Tree* spreading itself into two or three *Branches* from one common *Stem* near the *Root*: In- to any one of these *Branches*, in *August*, inoculate a *Bud* taken from a yellow-striped *Jessamine*, where it is to abide all Winter; and in the Summer, when the *Tree* begins to make its Shoots, you will find here and there some *Leaves* tinged with Yellow, even on the other *Branches* not inoculated, till by degrees, in succeeding Years, the whole *Tree*, even the very *Wood* of all the tender *Branches*, will be most beautifully striped, and dy'd with Yellow.

“ Green intermix’d. He adds, That though the
 “ inoculated *Bud* should not shoot out, or that
 “ it should live but two or three Months, and
 “ after that happen to die, or be wounded by
 “ accident; yet even in that little time it will
 “ have communicated its Virtue to the whole
 “ *Sap*, and the *Tree* will become entirely striped.”

And this Experiment myself and several others have made several Years ago: It gave me the first hint of the *Sap*’s Motion, and put me upon farther enquiry. But for a more immediate Satisfaction in this Point of the *Sap*’s Circulation, we may have recourse to any one of the *Tubymels*, or milky *Plants*; and upon cutting their *Leaves*, we shall plainly discover the Vessels through which the Milk flows to maintain the Life and Growth of the *Plant*.

The Motion of the *Sap* continues in a *Plant* as long as the Sun’s Warmth can keep it in a fluid State, but is condensed or thickened by a Winter’s Cold, and is thereby changed into the Consistency of Gum; and being thus stagnated, cannot move any more, till the Warmth of the following Spring, or some artificial Heat, rarifies it into its former liquid State.

It then renews its former Vigour, and pushes forth *Branches*, *Leaves*, &c. But we must not suppose it is only the melted *Sap*, that does that Office of *Germination*; the *Root* has not been idle while the *Branches* have stood still; it has not lost the Moisture of the preceding Autumn to impregnate and furnish itself with proper Salts or Nuture, from whence the *Tree* is to be maintain’d: Here is a Supply laid in, to furnish Food for the Summer, as some industrious *Animals* will do to nourish themselves in the Winter.

In the next place, it may not be amiss to confute a common Opinion, That the *Sap* returns to the *Root*

in *Winter*; for if it did so, how comes it, that *Trees* which are cut down in *November* and *December*, will put forth *Branches* and *Leaves* the following *Spring*, altho' they have no *Root* or *Earth* to feed them? This plainly shews, that the *Sap* is condensed or thickened in the *Tree*, during its circulative Course, by extreme Cold, and remains in that gummy State, till the Warmth of the *Spring* (as I have already said) liquifies it; and by the *Vapour* which must then arise from it, the *Buds* are push'd forth, so long as there is Matter sufficient to furnish them.

And now, since it appears from what has been said, that *Plants* have a Circulation of *Sap*, and proper Means whereby to supply themselves with *Food*, let us consider whether *Plants*, in their several kinds, do not require different sorts of *Food* one from another, like various sorts of *Animals* which differ in their *Diets*.

First, Then, *Land Animals* may be liken'd in general to those *Plants* which are called *Terrene*, for that they live only upon the *Earth*; such as *Oaks*, *Beech*, *Elms*, &c.

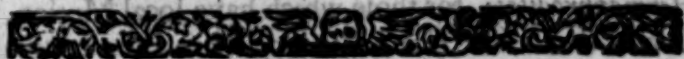
Amphibious Animals, such as the *Otter*, *Beaver*, *Tortois*, *Frogs*, &c. which live as well on the *Land* as in the *Waters*, may be compar'd to the *Willow*, *Alder*, *Mintbs*, and such others.

The *Fish Kind* or *Aquatick Race*, whether of the *Rivers*, or the *Sea*, are analogous to the *Water-Plants*; such as *Water-Lillies*, *Water-Plantains*, &c. which only live in *Rivers* or *Fresh-water*: Or the *Fuci*, *Coral*, *Coraline*, &c. which are *Sea* or *Salt-Water Plants*; and not any one of those will live out of its proper Element. From whence we may conclude how improper it would be to plant a *Water-Lilly* in a dry, sandy Desert, or an *Oak* at the bottom of the *Sea*; which would be just as unreasonable, as if we should propose to feed a *Dog* with *Hay*,

or a *Horse* with *Fish*. However, this Rule of Nature has been so little observed, even by some of our greatest *Planters*, that we can hardly boast of good Success in one out of five *Plantations* that have been made.

But I shall beg leave to remark yet farther, That as the several *Land-Animals* have their respective *Diets*, so have the *Terrene Plants* likewise their several Soils from whence they draw their Nourishment; as some *Animals* feed on *Flesh*, others on *Fish*, *Roots*, *Leaves*, *Grain*, or *Fruits*; so do we find that some *Plants* love *Clay*, others a *Loam*, *Sand*, or *Gravel*, &c. Nor is this all we ought to observe: We must consider likewise how beneficial to every *Plant* is a right *Exposure*, whether in a *Vale*, the Sides or Tops of *Hills* exposed to the *South* or *North* Winds, whether inland, or near the *Air* of the *Sea*; for it is a proper *Air*, that keeps a *Plant* in Health, and fits it to receive its Nourishment. And a certain degree of *Warmth*, peculiar to each kind of *Plant* is likewise worth our enquiry; for it is a *Warmth*, natural to each *Plant*, that puts its *Juices* in their proper Motion. But this may be more fully explained in another place. In the mean while, I shall proceed to examine in the next Chapter, by what means *Plants* are capable of generating, and to explain the Uses of that Discovery.

• *Vide* Chap. III.



C H A P. II.

Of the Generation of PLANTS.

IN the foregoing Chapter I have given my Reader such Hints as may serve to explain my *System of the Circulation of Juices in Vegetables*, and have endeavour'd to shew, that *Plants* are somewhat analogous to *Animals*: I shall now proceed to offer another Discovery, as new as the former, and depending on it, which I conceive will be of extraordinary Use to such as raise Plantations from *Nuts*, *Mast*, or any other kind of *Seed* or *Grain*. And altho' in this Treatise I have propos'd to give some Directions tending only to the Improvement of *Forest* and *Timber-Trees*, yet I hope to be excused, if in the Explanation of this wonderful Mystery of the *Generation of Plants*, I shall be forced to introduce such Kind of Plants as are not to be found in *Forests*, and to make some of my Experiments in the *Orchard* or *Kitchen-Garden*.

Moses tells us, in his Account of the *Creation*, That *Plants have their Seeds in themselves*; that is, every *Plant* contains in itself Male and Female Powers: The Text he has given us seems to be explain'd by this Discovery, and may lead us to consider, that *Plants*, wanting *Local Motion*, require therefore this Union of *Sexes* in themselves, by which Means they may generate without the Neighbourhood of other *Plants*: They are in this respect like *Muscles*, or other immoveable Shell-fish, which are *Hermaphrodites* of this Kind, having their Propagation without the Help of one of the same Species. I mention *Muscles* and other immoveable

moveable Kinds of *Shell-fish* as a particular Kind of *Hermaphrodites*; for those which have local Motion, such as *Snails* and *Earth-Worms*, when they couple with one another, at once perform the *Male* and *Female* Act of Generation. A H O

But before I proceed to explain this New System, I think myself obliged to declare, that the first Hint of this Secret was communicated to me several Years ago, by a worthy Member of the *Royal Society*, *Robert Bale*, Esq; who has had this Notion for above Thirty Years, that *Plants* had a Mode of *Generating* somewhat analogous to that of *Animals*. The Light which I received from this Gentleman, was afterward farther explain'd by another Learned Member of that Society, Mr. *Samuel Moreland*, who, in *Phil. Trans.* Numb. 287, Anno 1703, has given us to understand how the *Dust* of the *Apices* in *Flowers* (i. e. the *Male Sperm*) is convey'd into the *Uterus* or *Vasculum Seminale* of a *Plant*, by which Means the *Seeds* therein contain'd are impregnated. I then made it my Business to search after this Truth, and have had good Fortune enough to bring it to Demonstration by several Experiments; since which, a Gentleman of *Paris* has printed something of the same Nature, in the *Hist. de l'Acad. de Sciences*, for the Years 1711 and 1712, which were published about ten Years ago.

But to come to the Point; the *Lilly* being a Flower more generally known than any other, and its Generative Parts being large and exposed, I shall from thence endeavour to explain the Method which Nature makes use of to impregnate the *Seeds* of that and every other *Plant*, and by which Means the several *Species* of *Vegetables* have been continued to the World.

The *Flower* of the *Lilly* has six *Leaves* or *Petals*, which are set on upon the Summit of the *Footstalk*, mark'd (A) in the first Figure; they serve to guard

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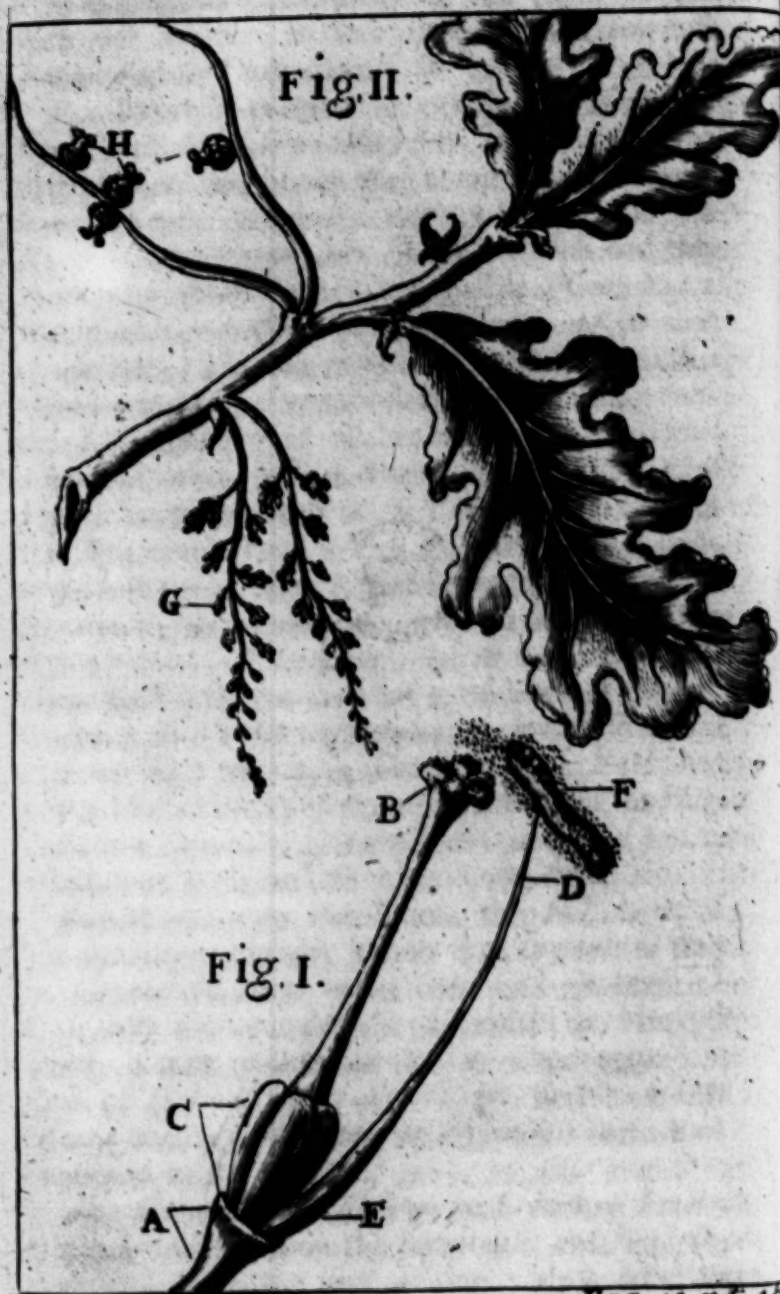
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guard the Parts of Generation from the Injuries of the Weather; and as they are of no other Use that I know of, so it is not necessary that I should place them in the Figure.

B is the Mouth of the *Pistillum*, or Passage which leads into the *Uterus C*, in which are three *Ovaries* fill'd with little *Eggs* or *Rudiments* of *Seeds*, such as we find in the *Ovaria* of *Animals*; but these *Eggs* will decay and come to nothing, unless they are impregnated by the *Farina Facundans* or *Male Seed* of the same *Plant*, or one of the same Sort.

From *D* to *E* is a *Stamen* of the *Lilly*, thro' which the *Male Seed* of the *Plant* is convey'd to be perfected in the *Apex F*, where, by the *Sun's Heat*, it ripens and bursts forth in very minute *Particles* like *Dust*; some *Particles* of which *Powder* falling upon the *Orifice B*, is either convey'd from thence into the *Utricle C*, or by its *Magnetick Virtue*, draws the *Nourishment*, with great *Force*, from the other *Parts* of the *Plant* into the *Embryo's* of the *Fruit*, and makes them swell.

Now, that the *Farina Facundans* or *Male Dust* has a *Magnetick Virtue*, is evident; for it is that only which *Bees* gather and lodge in the *Cavities* of their hind *Legs* to make their *Wax* with; and it is well known, that *Wax*, when it is warm, will attract to it any light *Body*. But again, if the *Particles* of this *Powder* should be required by *Nature* to pass into the *Ovaries* of the *Plant*, and even into the several *Eggs* or *Seeds* there contain'd, we may easily perceive, if we split the *Pistillum* of a *Flower*, that *Nature* has provided a sufficient *Passage* for it into the *Uterus*.

In the first Figure I have only given a *Design* of one *Stamen* with its *Apex*, to prevent *Mistakes* in my *Explanation*; but the *Flower* of every *Lilly* has six, of the same *Figure* and *Use*, which are placed round about the *Pistillum*, or *Female Parts*; so that

that 'tis almost impossible it should escape from receiving some of the *Male Dust* (or *Farina Facundans*) falling upon it.

In this and other *Flowers* of the like Nature, the *Pistillum* is always so plac'd, that the *Apices* which surround it, are either equal in Height with it, or above it; so that their *Dust* falls naturally upon it. And when we observe it to be longer than the *Apices*, we may then conjecture that the *Fruit* has begun to form itself, and has no longer occasion of the *Male Dust*. And it is likewise observable, that as soon as this Work of *Generation* is perform'd, the *Male Parts*, together with the *Leaves* or *Covering*, fall off, and the *Pipe* leading to the *Uterus* begins to shrink.

We may farther remark, that the Top of the *Pistillum* in every *Flower*, is either covered with a Sort of Velvet Tunick, or emits a gummy Liquor, the better to catch the *Dust* of the *Apices*.

And now, as we may find in the Description I have given of the *Lilly*, that the *Uterus* is within the *Flower*; so, on the other hand, the *Uterus* of a *Rose* is without the *Flower*, at the Bottom of the *Petals* or *Flower-Leaves*. And likewise in *Fruit-Trees*, the *Cherries*, *Plums*, and some others, have their *Uricles* within their *Flowers*; and the *Gooseberry*, *Currant*, *Apples* and *Pears*, on the Outside or Bottom of their *Flowers*. But farther; altho' Nature has design'd the *Dust* of the *Apices* to fecundate the *Female Parts* contain'd in the *Flowers* of *Plants*; yet we observe that in some *Plants*, the *Male* and *Female Parts* are remote from each other. As, for Example; the *Gourd*, *Pompion*, *Melon*, *Cucumber*, and all of that Race, have *Blossoms* distinctly, *Male* and *Female*, upon the same *Plant*. The *Male Blossoms* may be distinguished from the others, in that they have not any *Pistil* or Rudiment of *Fruit* about them, but have only a large
Thrum

Tbrum cover'd with *Dust* in their Middle: The *Female Blossom* of these has a *Pistillum* within the *Petals* or *Flower-Leaves*, and the Rudiment of their *Fruit* always apparent at the Bottom of the *Flower* before it opens: And so in like manner all *Nut-bearing*, and, I think, *Mast-bearing Trees*, have their *Catkins* or *Male Blossoms* remote from the *Female Parts*.

The *Oak*, for Example, which blossoms in *May*, has its *Male Parts* distinct from the *Acorns*; we find Strings of little *farinaceous Flowers* in great Abundance, as in the second Figure mark'd *G*, remote from the Rudiments of the *Acorns* or *Fruit*, mark'd *H*. And so likewise in the *Walnut*, *Chestnut*, *Hazel*, *Pine*, *Cypress*, and even the *Mulberry*, *Aspen*, and others. I have observed that some Sorts of *Willows* change their Sex every Year, by producing only *Male Blossoms* or *Catkins* one Year, and the other following, Strings of *Female Blossoms*, which, if they then happen to be near enough some *Flowering Male*, will produce *Seeds* not much unlike those of an *Apocinum*.

When we view, with a good *Microscope*, the *Male Dust* of one single *Plant*, we find every Particle of it to be of the same Size and Figure; but in some Cases it is of two Colours, as in the *Tulip*, where it is Yellow and Blue; but as *Plants* differ from one another in their Figures and Qualities, so are the Figures of their several *Dusts* greatly different from each other: A Grain of the *Dust* of *Geranium Sanguineum*, *maximo flore*, of *C, B, P*, is like a Bead of a Necklace with a Hole thro' it.

The *Farina* of the *Corona Solis perennis*, *Flore, & Semine maximis*, *Hort. Lugd. Bat.* is a Globe set with Thorns; that of the *Ricinus Vulgaris*, *C, B, P*, is of the Figure of a Grain of Wheat.

And the *Acer Montanum Candidum* of *C, B, P*, affords a *Dust* of the Figure of a Cross: And in like manner

manner does the *Farina* of every *Plant* differ in its *Shape* from the rest.

The Female Parts of *Generation* in *Plants* are best seen in large *Fruits*, without the Trouble of the *Microscope*; such as the *Fruit* of the *Pompion* or *Melon*, where, with the natural Eye, we may discover the *Vessels* distinctly, which make the *Tunic* or *Covering* of each *Ovary*: We may see how the *Seeds* are join'd to it, and by what End they receive their Nourishment. And again, between the several *Ovaries* contain'd in that *Fruit*, we may very easily perceive the *Vagina*, or Passage, through which the *Farina Facundans* has pass'd to impregnate the *Seeds*.

It may perhaps be objected against this *Hypothesis*, that there are many *Flowers* which hang downwards, as the *Crown Imperial*, the *Cyclamen*, &c. and that their *Pistils* cannot receive the *Farina Facundans* upon them: But if we observe that the *Pistils* of these *Flowers* are always more prominent, or somewhat longer than the *dusty Apices* which surround them, we may easily conceive that the glutinous Matter and Velvet Covering on the Extremities of the *Pistils*, may be capable enough of receiving and holding some of the Powder as it falls; and whether the Intromission of the *Farina Facundans* be requisite or not, its Lodgment on the Mouth of the *Pistillum* may, by Virtue of its attractive Quality, perhaps fecundate the *Seeds* contain'd in the *Uterus*: I am sure, in the Production of *Animals*, there are yet greater Difficulties to encounter with; and it may be, if the *Analogy* between *Plants* and *Animals* was more enquired after by the Learned, they might discover many new Things which would be serviceable to the Preservation and Benefit of *Animal Bodies*, as this Knowledge will be to the Improvement of the *Vegetable World*. We find, for

Example,

Example, that Trees are generally longer-lived than *Animals*, some of them living to four or five hundred Years; nay, we have some Accounts, by Tradition, of *Trees* that have lived above two thousand Years: The Reason, I think, is plain; for that, 1st, *Trees* have no Sensation, (for it is my Opinion, that the Senses prey abundantly upon the *Juices* of the Body they belong to.) 2^{dly}, They always breathe the same Air: And, 3^{dly}, They feed always upon the same *Diet*. And Man-kind, who in the first Times is said to have lived upwards of nine hundred Years, is said to have fed upon a *simple Diet*, and to have drank of the *clear Stream*; at least he had then but little Variety of Food. But I hope my Reader will pardon this Digression of mine, it may perhaps put him upon greater Discoveries.

I shall now proceed to what I call the *Demonstrative Part* of this System. I made my first Experiment upon the *Tulip*, which I chose rather than any other *Plant*, because it seldom misses to produce *Seed*. Several Years ago I had the Convenience of a large Garden, wherein there was a considerable Bed of *Tulips* in one Part, containing about four hundred Roots: In another Part of it, very remote from the former, were twelve *Tulips* in perfect Health. At the first Opening of the twelve, which I was very careful to observe, I cautiously took out of them all their *Apices*, before the *Farina Pacundans* was ripe, or any ways appear'd: These *Tulips* being thus castrated, bore no *Seed* that Summer; while, on the other hand, every one of the four hundred *Plants*, which I had let alone, produced *Seed*.

But as a farther Demonstration that *Plants* generate after the Manner I have endeavour'd to account for it, I shall recommend to my Reader the following Experiment: Make Choice of such
a *Plant*

a *Plant* of the *Hazel* or *Filberd*, as you find to be in a bearing State, and far distant from any other of the same sort: This *Tree* in *January* puts forth what are commonly call'd *Catkins*, which are long *Thrums*, composed of very small *Flowers*, that towards the Beginning of *March* are covered with a fine *Dust*, or *Male Seed*: 'Tis then the *Blossoms*, or *Female Parts*, appear on the *Buds* of the same *Tree*: They are very small, and hardly to be discern'd without strict Enquiry, only offering to the View a small Cluster of *scarlet Threads*, which are so many *Tubes* leading to the Rudiments of the *Nuts*: This happens at a windy Season of the Year, that the *Male Dust* may be more easily convey'd to the *Utricles* or *Female Blossoms* of the *Plant*. Now, as soon as the *Catkins* appear, they must be carefully taken from the *Tree*, and it will produce no *Fruit* that Year, unless you have a mind to single out any particular *Blossom*, of it, which may be impregnated with *Catkins* from another *Tree*, gather'd fresh every Morning for three or four days successively, and dusted lightly over it, without bruising its tender *Fibres*. And in like manner may the *Blossoms* of any other *Tree* or *Flower* be *castrated*, and will have the same Effect.

By this Knowledge, we may perhaps alter the Property and Taste of any *Fruit*, by impregnating the one with the *Farina* of another of the same Class: As for Example, a *Codlin* with a *Pearmain*; which will occasion the *Codlin* so impregnated to last a longer time than usual, and be of a sharper Taste; or if the *Winter Fruits* should be fecundated with the Dust of the *Summer Kinds*, they will decay before their usual time. And it is from this accidental Coupling of the *Farina* of one with the other, that in an *Orchard* where there is Variety of *Apples*, even the *Fruit* gather'd from the

the same *Tree* differ in their Flavour and Times of ripening: And moreover, the *Seeds* of those *Apples* so generated, being changed by that means from their natural Qualities, will produce different kinds of *Fruits* if they are sown.

'Tis from this accidental Coupling, that proceeds the numberless Varieties of *Fruits* and *Flowers* which are raised every day from *Seed*. The yellow and black *Auriculas*, which were the first we had in *England*, coupling with one another, produced *Seed* which gave us other Varieties; which again mixing their Qualities in like manner, has afforded us, by little and little, the numberless Variations which we see at this day in every curious *Flower-Garden*: For I have saved the *Seeds* of near a hundred plain *Auriculas*, whose *Flowers* were of one Colour, and stood remote from others; and that *Seed* I remember to have produced no Variety. But, on the other hand, where I have saved the *Seed* of such plain *Auriculas* as have stood together, and were differing in their Colours, that *Seed* has furnished me with great Varieties different from the *Mother Plants*. I believe I need not explain how the *Male Dust* of *Plants* may be conveyed by Air from the one to another, by which this *Generation* and *Production* of new *Plants* is brought about; but I shall hint by the bye, to such as plant *Orchards* for *Cider*, that they ought to plant only one sort of *Apple* in those *Orchards*; and that such *Plantations* be likewise remote from other kinds of *Apples*, whose *Farina* would else certainly spoil the *Cider-Fruit*, by ripening some sooner, and others later; which would occasion almost a continual Ferment in the Liquor, and never permit it to settle or grow fine.

Moreover, a curious Person may, by this Knowledge, produce such rare kinds of *Plants* as have not yet been heard of, by making choice of two

Plants for his Purpose, as near alike in their Parts, but chiefly in their *Flowers* or *Seed-Vessels*: For Example, the *Carnation* and *Sweet William* are in some respects alike; the *Farina* of the one will impregnate the other, and the *Seed* so enliven'd will produce a *Plant* different from either, as may now be seen in the Garden of Mr. *Thomas Fairchild* of *Horton*, a *Plant* neither *Sweet William* nor *Carnation*, but resembling both equally, which was raised from the *Seed* of a *Carnation* that had been impregnated by the *Farina* of the *Sweet William*. These Couplings are not unlike that of the *Mare* with the *Ass*, which produces the *Mule*; and in regard to *Generation*, are also the same with *Mules*, not being able to multiply their *Species*, no more than other Monsters generated in the same manner.

We may learn from hence, that the *Fruit* of any *Tree* may be adulterated as well by the *Farina* of one of the same sort, which perhaps may be sickly, and of a Dwarf-kind, as by the *Dust* of some other kind near a-kin to it, and worse than itself. Now, as such Coupling may be very frequent in common *Woods*, so would I recommend the Choice of *Seed*, to be made only from such *Plants* or *Timber-Trees* as excel in Greatness, or other good Qualities, and are far distant from others of meaner sorts, which might degenerate their *Seeds*, and cross our Expectations when they come to grow up; and this is as necessary to be observed among *Vegetables*, to maintain their good Qualities in the young *Plants* they are to produce, as it is in the Breeding of *Game-Cocks*, *Spaniels*, or *Running-Horses*.

There is but one sort of *Plant* that I know of which seems to be out of this Danger of coupling with other Sorts, and consequently of either improving or diminishing the Qualities of its *Seeds*,
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and that is the *Mistletoe*: The Parts of its *Flowers* are indeed as apt to *Generation* as those of other *Plants*; but I have never seen any Variety of this *Plant*, nor do I know any other nearly enough related to it to *ingender* with it; for whether we find it growing upon the *Oak*, *Willow*, *Lime*, or any other *Tree* whatever, the *Leaves*, *Flowers*, and *Fruit*, with its manner of *Growth*, are all alike. And since I have had occasion to mention it in this place, give me leave to take notice of some Particularities belonging to it, as that it is neither to be propagated in *Earth* nor *Water*, but upon *Trees* and *Plants* only. The Ancients made it a *super-plant* peculiar to the *Oak*, and tell us, that although it seemingly produced *Seed*, they did not believe that that *Seed* could possibly be made to *vegetate*; because, I suppose, they had try'd it in the *Earth* without Success. But as it is so frequently found growing on other *Trees*, besides the *Oak*, in our Times, I shall take occasion at once to overturn their Opinion in relation to this *Plant*, by shewing how it may be *propagated* from *Seed* upon any *Tree* whatever. About *Christmas*, when the *Berries* are ripe, they may easily be made to stick upon the smooth *Bark* of any *Tree* you have a mind to *propagate* them upon, whether it be the *Oak*, *Ash*, *Elm*, *Apple*, *Pear*, *Plum*, *Rose*, *Gooseberry*, or *Currant*, &c. The *viscous Juice* which encom-
passeth each *Seed* will bind it fast to the *Part* you place it upon; and with this small *Trouble* you may expect young *Plants* the following Year, provided the *Birds* don't devour the *Seeds* you have sown; therefore a *Net* would do well to secure them. I have seen twenty *Plants* of *Mistletoe* growing upon as many different sorts of *Trees* and *Shrubs* in one Garden, which were *propagated* in the same manner I have mentioned. And I believe it would be very useful in correcting the

too great Vigour of some *Fruit-Trees*, and bring them to bear, by taking from them the *superabundant Juices*, which are always destructive to *Prolificity*, either in *Plants* or *Animals*.

And now, from the Account I have given of the *Generation of Plants*, we may learn why double *Flowers* seldom bear *Seed*; because the *Dust* of the *Apices* is too much crowded with the *Petals* or *Flower-Leaves*, which for that reason cannot easily reach the *Style* or *Pistil* of the *Flower*, which is always prominent, and above the *Petals*, in full *Flowers*. It appears likewise, that the natural Properties of *Fruits* or *Seeds* may be changed by accidental Coupling with other *Plants*; and that the *Seeds* so alter'd may rob us of our Expectations in *Planting*, by having their Principles debauch'd by the *Dust* of *distemper'd* and *degenerated Plants*.

To conclude: I shall give my Reader a View of the generative Parts of some *Plants* done with a *Microscope*, which will yet explain to him some of the nicest Particulars relating to the Subject of this Chapter.

Plate II. Figure I.

- A the *Pedicle* or *Foot-stalk* of the *Tulip Flower*.
- B the *Pistillum* of the same.
- C one of the *Stamina* taking root in the *Pedicle* of the *Tulip*.
- D the *Apex*, or *Head* of the *Stamen*, which encloseth the *Farina Fecundans*, or *Male Seed*, in two Cells, which burst open when they are ripe.

Fig. II. Shews the *Pistillum* or *Uterus* of the *Tulip*, cut horizontally, and magnified with one of *Campani's Microscopes*.

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A the

A the Cavity of the *Vagina*; the *Tunick* of which Passage or Cavity is composed of very small Vessels, which are continued into several Coats of the *Ovaries*, and the Eggs within them marked b b b b b. All these Vessels seem to take their rise from three larger Pipes CCC, through which the Sap ascends from the Root in Steam or Vapour.

DDD shew three large Vessels, (whose Sap is in figure of small *Globules* of a bluish Colour;) through these Vessels the Sap descends in Liquor.

These large Pipes put forth Branches of Vessels about twenty times less than themselves; which passing horizontally through the several *Ovaries*, are divided into smaller *Fibres*, and at length are lost in the *Tunick* of the *Vagina*. — These are all of a pale-blue Colour.

EE direct to the fleshy Part which seems to be made up of many transparent Protuberances, of a pale-yellow Colour, lessening themselves as they come nearer to the outward Coat of the *Pistillum*.

Fig. III. Shews the *Pistillum* or *Uterus* of the *Tulip* split lengthways at A; wherein are discovered two of the *Ovaries* on each side the Passage of the *Vagina*.

B the *Apex* flinging out its *Dust*, which falls upon C, the outward *Ostium* of the *Uterus*, composed of spongy Folds, which emit a gummy Liquor.

D one of the *Petals* or *Flower-Leaves*, taking root on the *Pedicle*. N. B. This Figure is not magnified,

Fig. IV. Shews part of the *Pistillum*, split like that in the former Figure, but magnified.

A is the Cavity of the *Vagina*, into which the *Farina* is supposed to fall.

C is the Passage of one of the Vessels marked C, in the second Figure.

DDDD the Tunick of the *Ovary*, composed of many small Fibres.

E the Eggs, as they are fasten'd to the *Ovary*.

F a slender Fibre passing lengthways through the *Capfula*, and seemingly binding the Eggs together.

Fig. V. Is the *Matrix* of the single *Anemone*, surrounded with its *Stamina* and *Apices*. It is to be observed, the Eggs of this Flower are naked, standing on the outside of a little Button raised in the middle of the Flower.

Fig. VI. The Button with the Eggs on its outside, split lengthways,

Fig. VII. A is a *Stamen*, with its *Apex* of the *Anemone*, of its natural Size.

B, one of the Eggs or Seeds of the same, taken off from the Button.

Fig. VIII. The *Stamen*, with the *Apex* of the *Anemone* magnified. — In this Figure, at A, we see the Root of the *Stamen*.

BBBB the Length of the *Stamen* from its Root to the *Apex*, whereby it appears to be a hollow Tube.

C the *Apex* cover'd with its *Farina*.

Fig. IX,

Fig. VIII.



Fig. II

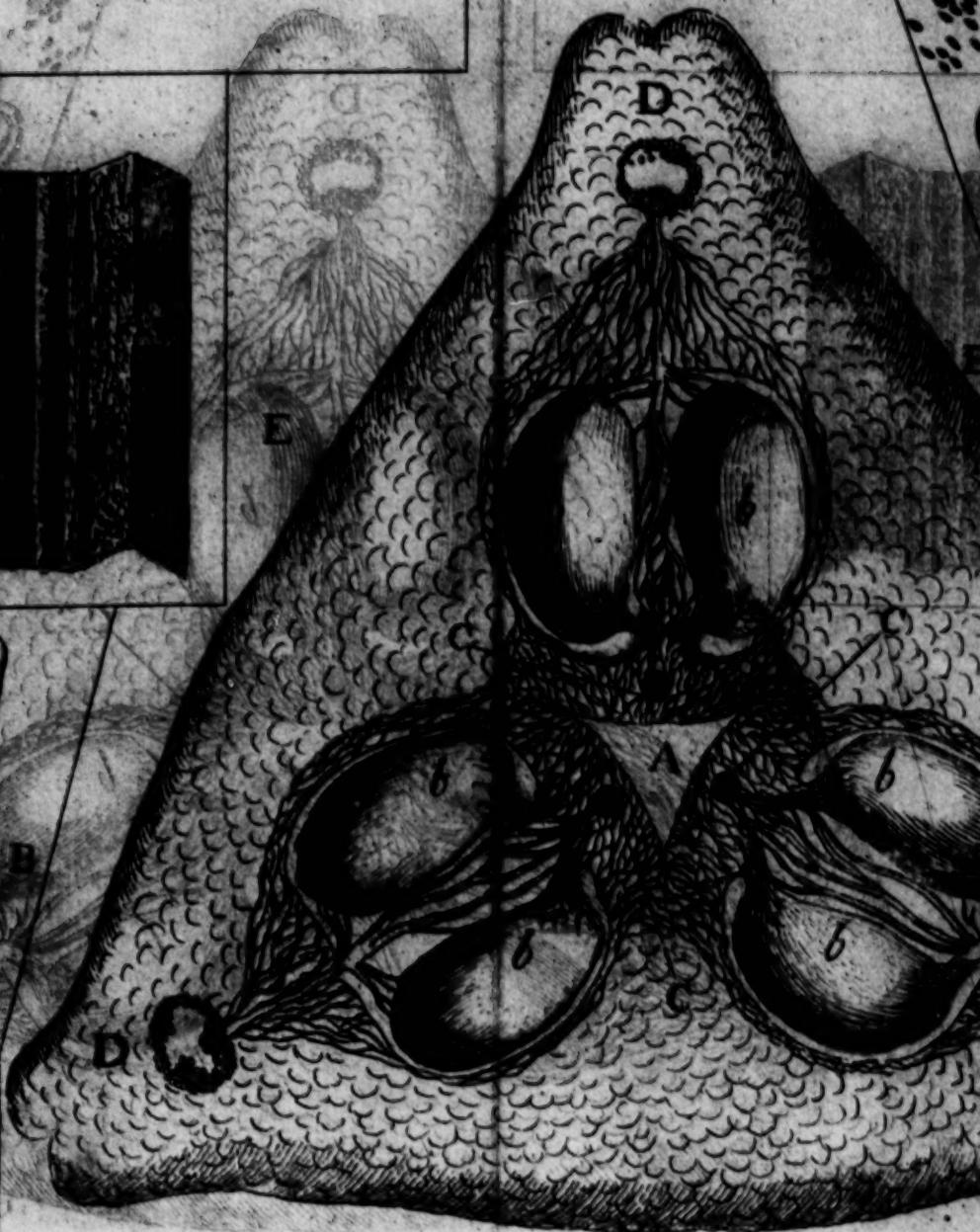


Fig. IV

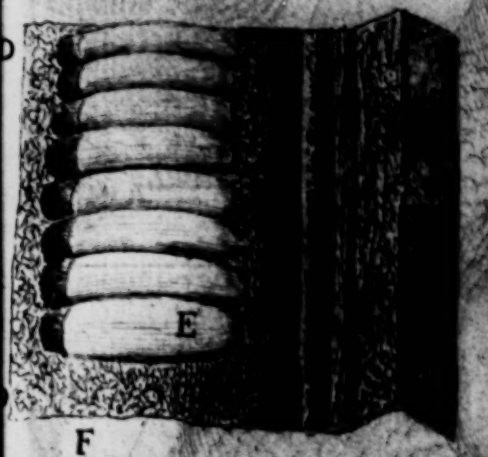


Fig. I

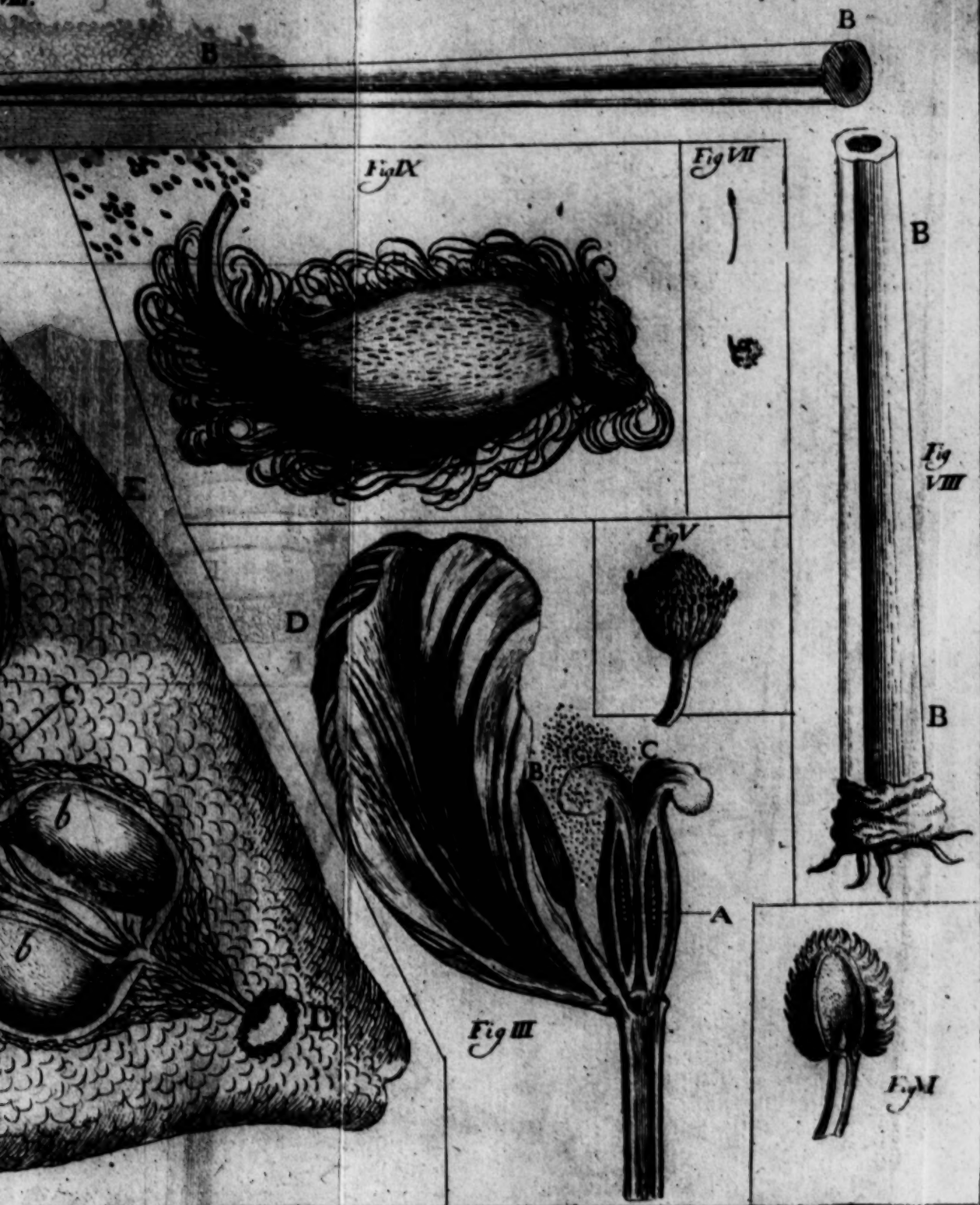
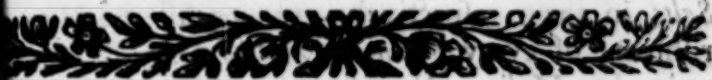


Fig. IX. Shews us one of the Seeds or Eggs of the *Anemone* magnified; whose outward Coat is cover'd with capillary Vessels, curl'd and running into one another, with a View of the Neck or Passage, into which the Male-Dust is supposed to fall.

Thus I have endeavour'd to explain what I proposed in the Title of this Chapter, viz. That *Plants* have a Mode of Generation somewhat analogous to that in *Animals*.



C H A P. III.

Of SOILS proper for the Nourishment of PLANTS, and Composts for forwarding the Growth of PLANTS.

IF *Plants* in their several degrees draw from the *Earth* such *Aliment* as is proper for their Subsistence, and that as the Nourishment they receive is more or less suitable to them, so they prosper accordingly; they may then reasonably infer, that there is a Circulation of *Sap* in *Vegetables*, in some respects like that of the Blood in *Animals*, as I have already endeavoured to shew in my first Chapter of this Tract: For, in *Animals*, it is very certain that a *Diet* is required by them; and that *Diet* being concocted, is the Matter from whence the Blood is drawn; and that as the Blood is, so is the State of the Body, either healthful, or distemper'd; then it reasonably follows, that we ought as carefully to provide wholesome and natural Nourishment for the Welfare of each respective

Plant we design to propagate, as we usually do the proper *Food* or *Diet* of every *Animal* we have a mind to nourish. The *Food* of *Land Animals* is of three Kinds only, viz. *Flesh*, *Herbs*, and *Seeds* or *Fruit*. So likewise the *Food* or *Terrene Plants* is of three Sorts; *Sand*, *Loam* or *Mother-Earth*, and *Clay*, in their several Degrees: And as the several Kinds of *Flesh*, the various Tribes of *Herbs*, and the many different *Fruits*, have each their respective *Animals* to feed upon them; so *Sand* in its several Degrees, *Loam* of different Sorts, and *Clays* of all Kinds, have certain Proportions of *Salts* in them respectively, proper for the Nourishment of every *Plant*, *Fruit* or *Seed*, I esteem to be the *Medium Nourishment* between *Flesh* and *Herbs*; and we find that every *Land Animal* will feed upon it, although their natural *Food* is either *Flesh*, or *Grass*. As for Example: A *Horse*, whose proper *Food* is *Grass*, will eat *Grain*; and so *Dogs*, and other *Creatures* who feed upon *Flesh*, will eat *Fruit*. And I am of opinion, that the *Salts* therefore of *Flesh*, *Fruit*, and *Herbs*, are the same, only differing in the Proportion of their Quantities; that is, one Pound Weight of *Flesh* may perhaps contain twice as many *Salts* as the like Weight of *Grain* or *Seed*; and one Pound of *Grain* twice the *Salts* as may be found in *Herbs* or *Grass*. Now, that all these *Salts* are proper for *Vegetation*, is evident by the common Practice of burying *Straw* or *Litter*, *Brakes*, *Halm*, and such-like, to enrich some *Soils*. Again, if *Fruits* and *Grain* be well consumed, one Load of it laid upon a Spot of Ground, will enrich it more than ten Load of *Horse-litter* or common *Dung*, says Sir *Hugh Platt* from Experience: And we are very sensible of the prodigious Effect of *Carriion*, *Leather*, or any Parts of *Animals* apply'd to the Roots of *Vegetables*.

So,

So, on the other hand, in natural Soils, what I call *Loam* or *Mother-Earth*, I suppose to be the *Medium* between *Sand* and *Clay*; that is, an Earth of a certain Temperature partaking equally of them both. And indeed, all Soils that I know of may be reduced under these three general Heads, viz. *Sand*, *Loam*, and *Clay*; for all others, although they may bear different Names, are in some respect depending upon one or other of these. *Gravels*, and all the open *Soils*, till we come to the *Loam* I mention, are of the *Sandy Race*; and the binding *Earths*, from *Loam* downwards, till we come to the Stiffness of *Chalk* itself, may be ranged with the *Clay Kind*. I find all these *Soils* are alike tending to *Vegetation*, and have their *Salts* proper for it, but in different Proportions of Quantity; that is, a Peck of *Clay* has perhaps twice as many *Salts* in it, as the same Quantity of *Loam*; and that Quantity of *Loam*, twice as many *Salts*, as the same Proportion of *Sand*. Now, from this Argument of mine, it may seem at first view, that *Clay* is the most proper *Soil* to forward the *Growth* of *Plants*; whereas we know that *Sand* is much more apt to produce *Plants* quicker than any other *Soil*: But give me leave to explain this Paradox. *Clay*, whose Parts are closely wrought together, will not easily give out those *Salts* contained in it; neither can the tender *Fibres* of every *Plant* make their way thro' it in search of their Nourishment: But if we open its Parts, by digging and breaking it into small Particles, and keep those Parts open by a Mixture of some sharp *Sand*, or other Body of the like nature, we shall not fail to see the Effects of its Vigour.

On the other hand, *Sand* is apt to push forward the *Plants* growing upon it early in the Spring, and will even cause them to *germinate* near a Month sooner than the *Plants* growing upon a *Clay*: The Reason

Reason is, that the *Salts* in a *Sand* are at full Liberty to be raised and put in Motion, upon the least Approach of the Sun's Warmth: but then as they are hasty in their Work, so are they soon exhaled and lost.

The *Clay* has certain *Plants* growing upon it, which are natural to it, and consequently thrive better in it than in any other *Soil*.

And the *Sand* likewise has its natural *Plants*, which delight in it, and will not equally prosper in any other *Earth*.

However, both the *Clay Plants*, and those of the *Sand*, will grow in the *loamy Soil* I have mentioned, for that it partakes of the Qualities of *Sand* and *Clay*, as Grain doth of *Flesh* and *Herbs*, in respect to the *Food* of *Animals*.

I might here take Notice that the Word *Loam* is variously received, and understood by Planters. Some mean by it the most common superficial *Earth* met with in *England*, without any Regard to the Proportions it bears of *Sand* or *Clay*. Others would have it more inclining to *Clay* than *Sand*: However, I shall endeavour to avoid all Disputes that might arise concerning it, by once more repeating, that when I shall have Occasion to mention it, I mean only that Degree of *Earth* which equally partakes of *Sand* and *Clay*.

This *Earth* then, which I call *Loam*, may either be of a black, or yellow Colour; but let it be either the one or the other, Experience shews us the *Plants* of all Sorts will grow in it; and, for the Reasons I have before mentioned, it appears to be a more beneficial *Soil* than any other, wherever it happens to be found.

Now, as I take it, seeing that *Loam* is so happy in its Productions, that even *Plants* naturally bred in different *Soils* will thrive in it, it then seems reasonable, that if by Mixtures of

Natural

Natural Earths one with the other, we make such a Compost as may nearly imitate it, we may expect far greater Success from a Mixture of that Sort (especially in *Plantations* of durable *Trees*) than any Composition we can devise to be made with *Dungs*, or other forcing Ingredients. For it is very well worth our Remark, that *Animals*, and *Vegetables* also, of all Sorts, are more lasting, as they are fed by simple and natural Diet, as I have hinted before. It is true, *Hot-beds*, or any other Means of the like Nature, would indeed forward the *Growth* of *Trees*; perhaps as much in one Year, as Nature of herself would do in six; or, as Dr. *Agricola* of *Ratisbonne* pretends by his artificial Compost to raise *Forest-Trees* to exceed the Height of Twenty Foot in a few Days time: But we may be assured they can never last out half their Days, for we find the same in *Animals*, but particularly in *Mankind*, who by Excess of unnatural *Foods*, and invigorating *Liquors*, shortens his Life; while on the other hand, such Men as have bare Subsistence, and are forced through Necessity to live upon the natural Food of their own Country, are long-lived. I therefore would advise, as well from what I have said, as from the Observations and Inquiries I have made of the *Growth* of *Timber-Trees*, that they may not be forced by any violent Means, if we design them to last long, and improve themselves to be valuable; neither to take them from a Nursery of rich Ground, and expose them afterwards in such *Land* where they may want the same Plenty of Nourishment they have been used to; for then they would certainly decline and deceive us. Let the Earth we design to plant them in, be fresh and well open'd in its *Parts*; and if it should be sifted, it will help the striking of young *Roots*
at

at first planting, and support them till they can gather *Strength*.

I think I need not farther explain, that equal Quantities of *Sand* and *Clay* well mix'd together will afford us the desirable *Soil* we seek after, in case the *Loam* or *Mother Earth* I mention cannot conveniently be met with. But this has its greatest Use, when we make new *Plantations*; for we ought also to examine the Depth of the *Soil* underneath, into which our *Trees* are afterwards to push their *Roots*, and from whence they are to draw their chief Nourishment, and that may be best known from Observation; that is, by examining the most vigorous *Trees* of every Kind, and observing the *Qualities* and *Depths* of the *Soils* they feed from, and from such Examples to make our *Plantations* accordingly; we shall then find that an *Oak* will never make good *Timber*, if it be planted or sown upon a shallow rocky *Soil*; and at the same time, that an *Ash* will grow there; but this I shall more fully explain in the next Chapter of *Forest-Trees*.

And now, seeing that some delight more in the quick *Growth* of the *Trees* they plant, than the Advantages which would accrue to their Families, from a regular and natural *Growth* of their *Plantations*, I shall mention some *Mixtures* which have been experienced to forward the *Growth* of *Trees*.

Mixture the first. If the *Soil* be stiff, inclining to *Clay*, let it be well broke and open'd, of which take about five Load; add to it an equal Quantity of *Heath Turfs* burnt; let these Ingredients be well mixed and sifted, or skreen'd together, after they have lain for a Winter in a *Heap* or *Ridge*. This *Compost* will forward *Trees* extremely.

Second

Second Mixture. To four Load of *stiff Soil* broke and open'd as before, add as many Load of *sharp Sand*, to which put two Load of the *Asbes* of *burnt Furzes*, *Gorse*, *Fern*, *Weeds* or *Wood*; let this be well mix'd together about *September* or *October*, and be laid up in a *Ridge* till the *February* following, to be skreen'd or sifted for Use. Sir *William Bruce*, a Gentleman of *Scotland*, made use of the like *Mixtures* in his Garden, with the Success he desired.

Third Mixture. One Load of *Rotten Wood*, such as may be found under a *Wood Pile*, or for want of that, the same Quantity of *Rotted Leaves*. To either of these add a Load of *burnt Grass Turf*, two Load of *Sand*, and the like of *stiff Soil*; this Composition must be well mix'd and laid in a *Ridge* from *October* till *February*, and be sifted for Use. *N. B.* These artificial *Soils* should always be compos'd about *October*, and sifted the following Spring just before you use them; for if you should prepare them in the Spring, the Summer's Heat would exhale their *Volatile Spirits*; and besides, *Weeds* would be apt to rob them of their Nourishment, unless they were to be made in some shady Place under *Trees*.

Fourth Mixture. Take the Quantity of a Load of *Rape Seeds*, after the *Oil* is press'd from them, which may be very easily had at the *Rape Mills* at a small Expence; add to them two Load of *Sand*, one of *stiff Soil*, and one of *burnt Heath*, or *Grass Turf*, prepared as the others, and sifted, will greatly forward the Growth of any Plant.

Fifth Mixture. Take one Load of *Malt Grains* (after *Brewing*) add to it two Load of *Sand*, and two of *stiff Soil*, mix'd and prepar'd as before; it will make an incomparable Compost to hasten the Growth of Plants.

Sixth

Sixth Mixture. *Sheeps Dung*, with a like Quantity of *Wood-Asbes*, and twice as much *Loam*, or *Molber Earth*, prepared as before, will greatly forward the *Growth of Herbs and Trees*.

Seventh Mixture. Take of *Horse-Dung*, well consumed, two Load; add to it one Load of *Turf Asbes*, two Load of *Sand*, and two of *stiff Earth*; prepare this *Mixture* as before, and it will greatly forward *Germination of Plants*: But if *Sea-Coal Asbes* are more easily found, put them in the Place of the burnt *Turf*, and then add one Load more of *stiff Earth* to the *Compost*.

And now, besides the several Compositions which I have set down, I might add those which I have known to have been prepared with the *Soil of Poultry*, that feed upon Corn or Grain. I found those *Ingredlents* very hot and full of *Salts*, greatly tending to *Vegetation*, and abundantly quicker in their Operation than the *Soil of Animals*, which only feed upon *Herbs*; but that is no great Wonder, if it be true, what Sir *Hugh Platt* says, that one Load of Grain will enrich Ground more than ten Load of common *Dung*; and also from what I know from Experience, and have mention'd in the Fourth and Fifth *Mixtures*, prescribed in this Chapter. Now, if simple Grain by Infusion only (if I may so term it) in the *Mixtures* or *Composts* I have directed, has a good Effect, we may easily imagine how much more powerful it will be when it has pass'd through the Bodies of *Animals*. I could say much more upon this Head, but as it is my Design to be as short as may be convenient, and purposing chiefly in this Treatise to contribute such Experiments as may tend to the Improvement of *Plantations of Forest Trees*, I shall not here enlarge upon *Soils*, but leave some Particulars for another Work, and sum up this Chapter, with two or three short Remarks;
first,

first, that a *Preparation* of natural *Soils*, answerable to the *Loam* or *Mother Earth* I have mention'd, is certainly the best for all Sorts of *Forest Trees* to be planted or sown in, if we design them to make good Timber; and if it is rather desired that such *Trees* should grow quick, and consequently be subject to decay early, or be prejudiced by *Blights*, I have made mention of such forcing *Composts* as will set them forward in their *Growth*, but in my Opinion might be better employ'd in Gardens for the Production of short-lived *Plants*.

CHAP. IV.

Of Timber-Trees, and Underwood: Of Felling of Timber; and Dressing and Cleaning of Woods.

SECT. I.

Of TIMBER TREES.

AS there is nothing which contributes more to the Honour, Beauty, and Welfare of an Estate, than timely and sufficient *Plantations* of *Timber Trees*, so I have chose to make the *propagating* of *Timber* my present Subject; and what I have said in the former Chapters may, I hope, contribute something towards our Success in the Undertaking, which will so greatly contribute to the Welfare of every Man of Estate, if it be rightly understood. For altho' a Gentleman may perhaps be possess'd of a plentiful Fortune, suppose of 10,000 *l. per Annum*, he ought certainly to consider, that in Process of Time he must provide Fortunes for Children out of that Estate, proportionable to his Honour.

nour. And again, his Children must likewise make farther Provisions out of their several Parcels for their Issue, and so on, till at length, in six or seven Generations, we shall find the Paternal Estate cut to Pieces, into so many little Shares, that there will hardly remain any Idea of the plentiful Stock of their Ancestors. Now, I say, it would certainly be a Token of great Wisdom, for every Gentleman of Fortune, not only to consult all proper Means, how to maintain the Bulk of his Estate entire, but continue it so in his Line, wisely guarded against the Hazards of Fortune, and even the natural Consequences I mention, by timely and necessary *Plantations* upon it, which would be so many Monuments of his Wisdom and improving Treasuries for the Good of his Posterity: And besides, how beneficial would such *Plantations* be, in case of extraordinary Accidents, the Profuseness of a young Heir, the Discovery of Iron or Lead Mines, where Wood is of such extraordinary Use; or for the raising a Sum of Money upon any Emergency? I may add likewise, besides the private Interest of the Proprietor, it would be of general Use, and for the Nation's Good. How happily is *England* situated for Trade? What Benefits doth she receive from her Shipping? And therefore how profitable and useful is her *Timber*? which will yet become more valuable than ever, in that so much is continually cut down, and very little Care taken to make new *Plantations* for future Benefit. In a word, the present State of *Timber* in *England* is so very inconsiderable, in respect to the great Use made of it, and even that which remains growing is generally so much neglected in its Culture, that I hope some Directions for its Improvement may not be unacceptable to the World.

The *Trees* which have been commonly propagated in *England* for *Timber*, are the *Oak*, *Ash*, *Beech*,
Elm,

Elm, Chestnut, and Walnut: These are of the upper Class; and we may add to them the *Ilex*, or *Ever-green Oak*.

Of the lower Rank, for *Underwood*, or more indifferent Use, are the *Hazel, Alders, Willows*, and some others of less note.

The *OAK*, like all other *Plants*, has its *Varieties*; which are taken notice of by the *Botanists*. I have observed about five Sorts in *England*; but I shall only recommend two Kinds of them to be planted for *Timber*. The first and best in my Opinion is the *Upright-oak*, which grows more erect than any other; and the second is the *large Spreading-oak*. We have many Instances of these Kinds that have attain'd to such prodigious Greatness of Stature, that the *Timber* alone of one Tree has been sold for upward of 50*l*. The *Oak* doth not only afford us the most serviceable *Timber* for naval Architecture, but also for other Building. Its *Bark* is useful to *Tanners*, and the *Oak* is therefore cut down about *April*, when its *Bark* will peel. The *Acorns* are excellent Food for Hogs. This Tree delights in moist Ground of a good depth, and will prosper in the coldest *Clay*, and, as *Mr. Evelyn* says, in *Gravel* also. It is noted likewise, that some *Oaks* having been sown in Hedge-rows, have in the space of 30 Years born a *Stem* or *Trunk* of a Foot diameter. I have myself seen some seedling *Oaks* of 20 Years Growth of near that Substance, which had never been removed from the Place where they were sown; and I would advise, that every Plantation of *Oaks* be set from *Acorns* on the very Spot where they are to remain; and that we are likewise careful to chuse our *Acorns* from thriving, vigorous Trees, for the Reasons I have before mention'd. The Distance between them ought to be about 33 Foot, and the said Space between the *Oaks* should be

interfown or planted for *Underwood*, as I shall direct in the following Chapter.

Of the *ASH* there are two Sorts (falsely distinguished by the Names of *Male* and *Female*,) which most deserve our Care, in that they are quick Growers, and rise to a prodigious Stature: Besides these, there are several other Kinds which are not worth our notice; so that we ought to be careful in the Choice of the *Keys* or *Seeds* we design to sow. I have heard of *Ash* Trees of 40 Years Growth from the *Seed*, that have been sold for 25*l.* a-piece; which have grown on Plains, in light *Earth* not very deep: And Mr. *Evelyn* tells us, that one Person planted so much of this sort of *Timber* in his Life-time, as was valued worth 50,000*l.* to be bought; which he justly remarks, was very good Encouragement for a small and pleasant Industry. The *Keys* of this *Tree* are sowed about *October*, or else may be laid at that time in *Sand*, *S. S. S.* till the following Spring, and then sown. The *Timber* of the *Ash* is used for Ploughs and Axel-trees, Wheel-rings, Oars, and many other mechanick Works: And if we propagate the *Ash* for *Underwood* only, it will turn to good account for Hoops and Hop-poles. It may be cut about *February*.

The *BEECH* delights in Mountains. In *Berkshire*, in the *Chalky Hills*, this Tree is very prosperous, and attains a considerable Stature. Its *Timber* is used about Keels of Ships, and many Implements of Husbandry. It is the most common *Fire-wood* of *England*, especially about *London*, where Billets are usually burnt. Among the Coal-pits near *Newcastle upon Tyne*, this Wood is much used to make Cart-ways; where for many Miles, the Wheels of the Coal-waggons run upon it; which saves the Expence of Horse-flesh. This Wood will remain sound for many Years in

those marshy Lands, and is much esteemed for that Use. From the *Seed*, which is called *Beech-mast*, the *French* have long since drawn a very sweet Oil for eating, and lately the same has been practised in *England*. This *Seed* is likewise good to feed *Deer*, *Hogs*, and *Fowl*: It may be sown about *October*, or put in *Sand* like the *Asb-Keys* till Spring, the better to preserve it from *Vermin*. The *Timber* may be cut as the former.

We have many sorts of *ELM* frequent in *England*, among which the *Vulgar* or *Mountain Elm* is counted the best for *Timber*: I shall therefore recommend this *Sort* to the Planter before all others. It may be propagated from the *Seed* or *Camera*, which ripens and falls from it towards the latter End of *April*, or Beginning of *May*; it must then be sown in fine sifted *Earth*, or what I call *Loam* in the foregoing Chapter. This *Seminary* must be made in a shady Place, and watered from time to time, as the *Earth* begins to dry: But besides this way of raising *Elms*, we may either propagate them from *Layers*, or *Suckers*; which last must be transplanted into *Beds* of fine *Earth* about the Beginning of *March*, and kept well watered. And so naturally is the *Elm* inclined to *Vegetation*, that I have heard some affirm, by sowing only the *Chips* of it in a Piece of plow'd Ground, they have raised a large Quantity of these Trees; which perhaps is not impossible: For I am assured in other Cases, the *Buds* and *Leaves*, nay, the very *Fibrous Roots* of *Plants*, have been made to *vegetate* and produce Trees. As for Example: The single *Leaves* of *Oranges* have been made to strike *Root*, and produce *Branches*, *Leaves*, *Flowers*, and *Fruit*, by setting them half-way in the *Earth*; and Mr. *Fairebild* of *Hoxton* has done the like with *Leaves* of *Laurustinus*: However, let us raise our *Elms* which way we will, I shall advise that they be

not *planted* out of their first *Beds* till they have stood there two Years; and then remove them to greater Distances from each other, and let them so remain till you plant them out for good, at about 20 Foot distance in *Beds* of the sifted *Loam* directed: They grow quick, give a fine Shade, and afford valuable *Timber*: And if the *Witch Elm* or *Dutch Elm* be grafted upon this Kind, we may expect them to make *Shoots* of above eight Foot long in one Year, and produce *Leaves* of an extraordinary Bigness; but the Wood will then not be so valuable. This Tree delights in an *Earth* competently fertile, neither too dry or sandy, or too cold and spungy; nor does it require a deep *Soil*. Let it be moderately refreshed with Water after *planting*; and to keep the *Earth* about the *Roots* more open, and ready to receive Wet, cover the *Bed* it is *planted* in with rotten *Fern*, or other such-like Matter. A Year or two after *planting*, you may refresh the young *Fibres* at the Extremities of the *Roots* with some fine sifted *Earth*, or any one of the four first *Mixtures* mention'd in the foregoing Chapter, which will make the Tree shoot prodigiously, for that they contain *vegetable Salts* in great abundance. The *Timber* of this Tree is very serviceable, especially where it may always lie wet, it will last a long time; it is mightily used for Pipes, Pumps, Mills, and such Parts of Ships as lie constantly under Water: In a word, it is almost of general Use. The Time of felling it is from November to February.

We have two Kinds of *CHESNUT* in *England*; that which bears *edible Fruit*, and the other which is called the *Horse-chesnut*. The first of these Trees affords good *Timber*, and the latter is only desirable for its pleasant Shade and beautiful Flowers. These Trees may both be raised by set-

ring the *Nuts* about three Inches deep in a light, sandy *Soil*, towards the latter End of *February* or Beginning of *March*; but as the first only is useful, so I shall chuse to recommend it to the *Forester*. It delights in high Grounds remote from Water, which would spoil both its *Timber* and *Fruit*, and should indeed be set from the *Nut*, where it is always to remain; for it is apt to suffer greatly by removing, and spread too much in its Branches, when it loses its *Tap-root*, as all other *Tap-rooted* Trees are known to do. Its *Timber* is lasting if it be kept dry, and good for Building; and if it be planted for *Underwood*, it will afford excellent Poles and Stakes in nine Years after sowing, worth at least 10 s. per Hundred. The *Fruit* is sometimes used at our Tables, but more commonly given to *Deer* and other Cattle to fatten them. We may fell the *Tree* any time between *November* and *February*.

Among the *Botanists*, there are reckon'd many Sorts of *WALNUTS*; two only of which I shall recommend to the *Planter*, viz. that with the soft *Shell*, for the sake of the *Fruit*; and that with the black *Grain*, for the Goodness of its *Timber*. They are both raised from the *Nuts*, like the *Chestnut*; and should, like them, be sown in the Places where they are to remain. They are in great danger of Death if they lose the *Tap-root*, but will thrive extremely if they have Depth of Earth to strike into. The *Walnut* grows well in *Loam*, but will flourish also in *Chalk*, or gravelly *Soil*, either on hilly Ground, or in a Vale, which (I think) shews it to be a foreign *Plant*: For, as I have observed, every *Plant* natural to *England* has a *Soil* and *Exposure* peculiar to itself, and will scarce be made to grow in any other sort of *Land* or *Situation*. I have seen some *Walnut* Trees of forty Years Growth from the setting of the *Nuts* that were

valued at 5 *l.* a-piece ; and others standing by them, which were Trees planted at the same time (as the Owner himself informed me) that were not worth 30 *s.* a Tree : And the like Observation has been made of other *Tap-rooted* Trees, but particularly the *Oak* : So great is the Difference of *Growth* in downright-rooted *Plants* when they are set from *Acorns* or *Nuts*, and *transplanted* from the *Nursery*. The *Timber* is much used for Chairs, Cabinets, and Household Furniture ; it is durable, and an Enemy to Worms from its exceeding Bitterness. The *Nuts* yield abundance of Oil, and take place among the best *Fruits* for the Table. This *Tree* may be cut down when the *Sap* is fixed, *i. e.* from *November* to *February*.

The *I L E X*, or *E V E R - G R E E N O A K*, is a *Plant* which produces admirable *Timber* ; but is more particularly valuable for its *Knee Timber*, which is much tougher than that of our *English Oak* : It is in such request among our Ship-Carpenters, that many Ships Lading of it has been brought to *England*. The *Tree* is of quick *Growth*, and will attain to a very considerable Height, even to equal the tallest of the *English Oaks* ; to which Perfections we may also add the Beauty of its *Leaves*, which are green all Winter.

That curious Gent'leman *Robert Balle*, Esq; *F. R. S.* has, among other Improvements for the Good of his Country, propagated a large Parcel of these *Trees* in *England* ; some of which have in about 30 Years space grown to a considerable Greatness of Stature : And it is to be wish'd that others would follow his Example in the Culture of this beautiful and profitable *Tree*. This Gentleman has raised some Thousands of them from *Acorns*, and transplanted them with Success and great Judgment ; and to follow his Method, we must set the *Acorns* in *Loam* well sifted, in Garden-pots,

in

in *February*, and turn them out with the Earth about their *Roots* when they are two Years Growth, to transplant them afterwards at proper Distances, where they are to remain. These, like our *English Oaks*, are *Tap-rooted*, and therefore delight in deep Soil: They prosper in moist Land, rather on a Plain, than on hilly Ground. If we consult the *Anatomy of Plants*, we ought to be very careful not to injure their *Tap-roots*, which are always answerable to the *Leading-shoot* on the *Top* of the Tree. It is therefore reasonable to believe, that a Plant, by losing that *Downright-root*, is in danger of losing also the *Top-shoot* which is fed from it: And altho' a Tree may strike fresh *Roots* after the *Amputation* of this *Leading-root*, yet we may find by Experience, that the *Sap* will then push forth *Branches* in the Sides of the *Stem*, and discontinue its upright Growth. We may fell this Tree, as we do the other Oak, for the sake of its Bark. The *Acorns* are good Food for *Deer* and *Fowl*, which greatly delight in the Shelter of these Trees.

S E C T. II.

Of UNDERWOODS.

HAVING mention'd the most valuable Trees for Timber, I am in the next place to take notice of such others as will afford us the most valuable Crops of UNDERWOOD.

I have already observed, that the *ASH* and *CHESNUT* may be order'd in this manner, and bring considerable Returns to the Proprietor. The next which I shall propose for this Use is the *HAZEL*; which, if it be rightly managed, will turn to good account in *Coppices*. This Plant may be raised from the *Nuts* sown a little after they are

ripe, in cold, dry, sandy Ground; but if the *Land* happens to be more inclined to *Clay*, plow it in *Autumn*, and let it mellow with the *Frosts* till *February* before you sow them. The Learned advise, that after the *Seedling-plants* are come up, they should be weeded or hough'd, so as to leave the *Plants* at three Foot distance from each other; and after three Years *Growth*, to cut them off within half a Foot of the Ground: By which means they will be made to shoot forth many *Twigs* from each *Stem*, which in nine Years time (*i. e.* twelve from putting in the *Seed*) will be fit to cut for Hop-poles, Hoops, Faggots, and other such Uses; but if you rather chuse to use them for Hurdles, then they may be cut at five Years *Growth*. After the first Cutting, you may cut again in seven or eight Years, if they like the Ground, for Poles and Hoops, as before; and so continue to do from time to time as you see occasion. But these *Trees* may be likewise propagated by *Suckers*, which are frequently found growing about the *Roots* of old *Trees*, but are not very certain in their *Growth* after transplanting, unless they are carefully water'd, till they have struck good *Roots*. In a Plantation of this kind, which may be made at any time between *October* and the Beginning of *March*, when the Weather is open, these *Suckers* must be set at three Foot distance, and cut down within half a Foot of the Ground about the Beginning of *April* following, or they may also be propagated by laying down their *Branches* or *Twigs* about three Inches in the Earth; which will furnish us with abundance of young *Plants* in a Year's time. This Work must be done about *October*.

The next I shall treat of is the *WILLOW*, an *Amphibious Plant*. There are many Sorts of it distinguish'd by the *Botanists*, which should I mention

tion here by their several Names, I might perhaps perplex my Reader, and shall therefore only mention them as two Kinds; first, the *OZIERs*, which afford Twigs for the Basket-makers, and Binding-Rods; and, secondly, the Tree-kind or *WITHy*.

First then, the *OZIERs*, which afford us Twigs for Wicker-works, are raised by setting Slips of two or three Years *Growth* about a Foot deep in marshy or wet *Ground*, at two Foot distance from each other. This *Work* is best done about the Middle of *February*, if the Weather be open. The second Year after *planting*, they may have their Tops cut off, leaving their Stems about a Foot above *Ground*; so will they put forth Twigs, which must be again cut down early the Spring following: Which *Work* being continued every Year, the Owner will find considerable Advantage from such *Plantations*. An Acre of *Ground* thus managed will turn to better account than the like Parcel of *Land* sown with *Wheat*, or any Grain whatever: And it may be for this reason, that some would pretend to raise vast Sums of Money by planting several thousand Acres in this way, as I have been informed several Gentlemen propose to do. It is certain, at present, *Oziers* turn to good account; but I am of opinion, that if we had only as many more planted as we have now growing in *England*, the Markets would be over-stock'd with them, and their Price would fall: And besides, every *Ground*, as I have said before, will not produce them. In this Treatise may be found the several Sorts of *Trees* for Use, the different *Lands* they require for their Welfare, and the vast Returns they would bring in, if large *Plantations* were made of the several Kinds by a discreet *Planter*, who knew how to allot to every *Soil* the *Tree* proper for it. But I shall

shall proceed now to give some Directions for the propagating of the large *Wibby* or *Tree-kind*; which will also in a few Years time afford profitable, tho' not very durable *Wood*. Its Use is for *Perches*, *Rake-tales*, and such-like. *Branches* of three or four Years *Growth*, about two Foot in length, being set near two Foot deep in the Ground in *February*, about fifteen Foot asunder, will soon make handsome *Trees* which will bear *Lopping* every fifth Year: These love wet Ground, and will not be made to prosper in any other. I might add, that this, and several other sorts of *Willow*, might be raised from Seeds which are born on the *Female Juli*, if we sow them in wet, boggy Ground, as is practised in *France* and other Countries.

The *ALDER*, more than all other Trees beside, delights in boggy Places, and may be cultivated in the coldest wet Grounds. This *Amphibious Plant* is best raised from Truncheons or Branches about three Foot in length: Setting them about *February* a Foot deep in the Ground, they thrive exceedingly on the Banks of Rivers, and will make such Shoots in three or four Years time, as may be then cut and sold to good advantage for Poles and other Uses. It is a lasting Wood if it lie continually under Water; and, if we believe *Jos. Baubinus*, will in course of time turn to Stone; but if it be exposed, so as to be sometimes wet, and sometimes dry, it is of no duration. This *Plant* is also raised from Seed, in *Flanders*; where they make great profit of it.

S E C T. III.

Of Felling of *TIMBER*, and Dressing,
Cleaning, and Pruning of *WOODS*.

THUS have I given a short View of the several sorts of *Trees* which I would recommend to be planted for * *Timber* and *Underwood*: I have endeavour'd to ascertain the several *Soils* and *Situations* proper to each of them; which I hope may be of some use: For that in the Quantity of an Acre of Ground, we find Earths of very different Qualities, to any of which one or other of the *Trees* I have named may be allotted. And now, as I suppose that every Gentleman who is about to make a *Plantation*, will certainly make it upon his own *Land*, or at least on such a Parcel of Ground as will by Right be continued after his Demise in his Family, it is reasonable enough to believe, that such Persons may have upon their Estates some *Timber* already growing, some *Trees* prospering, others decaying: Now, I say, It would surely be good Husbandry to fell such *Trees* as begin to decline, either from too great Age, or too near Neighbourhood with others.

To the first, I can pretend to give no other Direction, than to have them cut down at the proper *Season*; but to the second, (*i. e.*) where they grow too close together, leave the most thriving *Trees* to grow and improve themselves, and cut up the others *root and branch*, leaving convenient Distances between the *Trees* which remain standing, which

* For a farther Account of *Trees* and *Underwood*, not mentioned in this Chapter, see the latter End of Chap. V.

which ought to be only such as have their *Tops* or *Leading-shoots* prosperous, and in good order.

Our Countryman *Lawson*, who had for above forty Years study'd the Improvement and Management of *Woods* and *Timber-trees*, has given us a very good Lesson concerning the *Dressing* and *Cleaning* of *Woods*; which being short and much to the purpose, I shall insert in his own Words:

“ How many *Forests* and *Woods*, wherein you
 “ shall have, for one thriving *Tree*, four (nay some-
 “ times twenty-four) *evil-thriving*, rotten, and
 “ dying *Trees*, even while they live; and instead
 “ of *Trees*, thousands of *Busbes* and *Sbrubs*! What
 “ *Rottenness*, what *Hollowness*, what *dead Arms*,
 “ *wither'd Tops*, *curtail'd Trunks*, what *Loads* of
 “ *Moss*, *drooping Boughs*, and *dying Branches*, shall
 “ you see every where; and those that are in this
 “ sort, are in a manner all unprofitable *Boughs*,
 “ *canker'd Arms*, crooked, little, and short *Bolls*!
 “ What an infinite number of *Busbes*, *Sbrubs*,
 “ and *Scraggs* of *Hazles*, *Thorns*, and other unpro-
 “ fitable *Wood*, which might be brought, by
 “ dressing, to become great and goodly *Trees*!
 “ Consider now the Cause:

“ The *Lesser Wood* has been spoiled with care-
 “ less, unskilful and untimely *Stowing*; and much
 “ also of the *Great Wood*. The greater *Trees*, at
 “ their first rising, have fill'd and overladen them-
 “ selves with a number of *wasteful Boughs* and
 “ *Suckers*, which have not only drawn the *Sap* from
 “ the *Boll*, but also have made it knotty, and
 “ themselves and the *Boll* mossy, for want of
 “ *Dressing*: Whereas, if in the Prime of *Growth*
 “ they had been taken away close all but one *Top*,
 “ and clean by the *Bulk*, the Strength of all the
 “ *Sap* would have gone to the *Bulk*, and so he
 “ would have recover'd, and cover'd his *Knots*,
 “ and have put forth a fair, long, and strait Bo-
 “ dy

“ dy for *Timber*, profitable, huge, great of bulk,
 “ and of infinite last.

“ If all *Timber-trees* were such, (will some say)
 “ how should we have crooked Wood for *Wheels*,
 “ *Curbs*, &c.

“ *Answer*. Dress all you can, and there will be
 “ enough crooked for those Uses.

“ More than this, in most Places they grow so
 “ thick, that neither themselves, nor *Earth*, nor
 “ any thing under or near them, can thrive ; nor
 “ *Sun*, nor *Rain*, nor *Air*, can come at them.

“ I see a number of *Hags*, where, out of one
 “ *Root*, you shall see three or four (nay, more,
 “ such is Men's unskilful Greediness, who desi-
 “ ring many, have none good) pretty *Oaks*, or
 “ *Asbes*, strait and tall ; because the *Root* at the
 “ first *Shoot* gives *Sap* a-main : But if one only of
 “ them might be suffer'd to grow, and that well
 “ and cleanly pruned all to his very *Top*, what a
 “ Tree should we have in time ? And we see by
 “ those *Roots* continually and plentifully spring-
 “ ing, notwithstanding so deadly wounded, what
 “ a Commodity would arise to the *Owner* and
 “ the *Commonwealth*, if *Wood* were cherish'd and
 “ orderly dress'd. The waste *Boughs* closely
 “ and skilfully taken away, would give us Store
 “ of *Fences* and *Fuel*, and the Bulk of the Tree
 “ in time would grow of huge Length and
 “ Bigness.”

And now, from what has been said relating
 to the Cleansing, Dressing, and Pruning of *Woods*,
 two Things naturally offer to the Benefit of the
 Proprietors : *First*, That the Profit which will
 accrue from the Fall of distemper'd and decaying
Timber and *Underwood*, will afford a Sum of Mo-
 ney sufficient to make large *Plantations*. And,
Secondly, The Trees which remain standing after
 this

this Weeding is performed, will grow and prosper exceedingly, by being then at liberty to receive a greater Quantity of *Nourishment* from the *Earth*, and by enjoying such a Proportion of *Air*, as their Age and Strength will require.



CHAP. V.

The Method of Planting an Acre of Ground with Timber-Trees and Underwood; with the Profits which will arise from that Plantation in nine Years, seventeen Years, and twenty-five Years after Planting. To which are added, Directions for the Management of Sycamores, Maples, Limes, Poplars, and several other Timber-Trees, omitted in the preceding Chapter.

IF we consider the many Advantages this Nation in general has received from the *Timber* of its own *Growth*, how by its powerful Fleets (the Offspring of its *Oaks*) *England* has gain'd the Dominion of the Seas, and now enjoys the Benefits of an universal Commerce, without mentioning the Advantages it affords to every particular Owner of it; it is wonderful to me, that the propagating of *Timber*, a Commodity so valuable and ornamental, should be so little encouraged now-a-days among us, when our natural Store is so near being consumed, that in all appearance, in a few Years time, we may be forced to seek it in foreign Countries.

Now,

Now, if I may be allowed to judge in this Case, I conceive that the present Decay of our *Timber* may depend upon one or other of the following Reasons:

First, That the making of *new Plantations* will be an immediate Expence to us. -Or,

Secondly, That we cannot hope to reap any *Profit* to ourselves from such *Plantations* as might be made in our Times. Or else,

Thirdly, That many Gentlemen, who are already Masters of *Woods*, receive little *Profit* from them, for want of due Care and Management.

The first and last of these Objections are answer'd, I think, in the foregoing Chapter; where the Advantages of cleansing and dressing of *Woods* are set down: In that not only Money is provided thereby to answer the Expence of *new Plantations*, but also the standing *Trees* will be put into a thriving Condition.

It remains now for me to answer the other Objection, *viz.* That we cannot propose to reap any *Profit* to ourselves from the *Plantations*, which might be made by us. But I hope the Method which I shall herein propose will give full Satisfaction to that Point.

For which end, I would recommend that every *Plantation* which shall be made either in this present Age, or hereafter, may consist partly of *Forest* or *Timber Trees*, and partly of *Coppice* or *Underwood*.

Now, the *Underwood* which I propose to be planted and intermixed among the *Timber Trees* or *Standards*, may be cut in eight or nine Years after planting; and so from time to time every eighth Year will produce a very considerable Return, as will appear hereafter in a stated Account.

Secondly,

Secondly, The *Plants* for *Underwood*, which will encompass on every side the young *Timber-trees*, will not only shelter them from Blasts of Wind, which might be hurtful to them, but will also (by keeping off the circumambient Air) draw them into strait and tall *Trees*, till they can shift for themselves, and are strong enough to bear the Severity of the Weather.

But, to proceed: Let us make choice of such Ground to plant upon, as may not be thought proper for Corn, or at least such as will yield only a poor Crop of Grain: I suppose such Land will be worth about five Shillings *per Acre* by the Year; and by all means let it be, if possible, near some navigable River, for the greater Ease and Cheapness of Carriage. Now, as I have before hinted, that as the Land is, so must we allot the proper *Plant* for it; I only wish it may be deep enough to nourish the *Oak* and *Ilex*, which are *Tap-rooted Plants*, and therefore delight in deep Soil.

Supposing then we are fortunate enough to meet with an Acre of Ground proper for *Oaks*; we must first encompass it with a good Fence, and then either dig or plough the Land at a proper Season, to lie fallow for some time, till the Turf be mellow'd, and fit for our Purpose.

An *Acre* of Ground contains one hundred and sixty square *Perches* or *Rods*, each Rod being sixteen Foot and a half. This Quantity of Land must be fenced about with a Ditch six Foot wide, three Rows of *Quicksets* planted upon the Sides of its Banks at a Foot distance from each other, and a dry Hedge on the Top.

A Labouring-man working for one Shilling *per Diem*, may prepare nine Foot of the Ditch

in

in length in one Day, and cut Stakes and Bushes, and make about five Rod of the dry Hedge in a Day; so that he may prepare the Hedge, make the Ditch, plant three Rows of *Quicksets*, and pay the Expence of them after the rate of two Shillings *per Hundred*, for about three Shillings the *Perch*: So will the whole Charge of making a Fence about an *Acre* of Land be seven Pounds sixteen Shillings. But we may fence in two *Acres* of Land after the same rate, being thirty-two *Perch* long, and ten *Perch* wide, for nine Pounds six Shillings; for the same reason, that if one hundred *Hurdles* will hold a thousand Sheep, two *Hurdles* added to them will hold two thousand Sheep; that is, if the Sheep-pen has forty-nine *Hurdles* on each Side, and one at each End, it just contains half the Quantity of Ground that it would do if it had the Breadth of two *Hurdles* at the Ends. *N. B.* A *Pole* or *Perch* planted with three Rows of *Quicksets*, will take up about forty-eight *Plants*; so will there be required to plant about an *Acre* 2496 *Plants*.

Thus having provided a good Fence to defend our young *Plantation* from Dangers of Cattle, and other Inconveniencies, the next thing to be done is to prepare the enclosed Land for *Planting*; which may be perform'd several ways.

Supposing the Land to be encumber'd in the worst manner, with Bushes, Whins, or Furze, &c. so that a Plough cannot be used upon it, then may it be dug and clean'd for about Sixpence the square *Perch*: The whole *Acre*, if it be dug at that rate, will come to four Pounds. But if the Ground should happen to be in that state that a Plough can work in it, an *Acre* may be plough'd for about twelve Shillings.

The Land being thus prepared, one *Acre* will contain forty Plants of *Oak* at thirty-three Foot distance: And, as I have hinted before, that all *Tap-rooted* Trees are endangered by removing, and that when they are *transplanted*, they seldom come to the Perfection of those which are raised from *Seed*, and remain always in the same Place; I shall therefore recommend, that forty Beds of good natural *Soil* be prepared on the *Acre* of Land, at the aforesaid Distance of thirty three Foot from each other, and that in each *Bed* five or six *Acorns* be planted at about four Inches deep in *February*; which Season I chuse rather than *Autumn*, because the over Wet of some Winters might rot the Seeds; or *Mice*, *Squirrels*, and such-like Animals, might destroy them.

These forty *Beds* may well be prepared by one Man in three Days, at one Shilling *per Diem*: Two hundred *Acorns* may be worth about Sixpence, and the Planting of them be worth Sixpence more; which makes in all four Shillings.

The *Acre* of Land being thus sown with *Oaks*, we may interrow the remaining Part of the Ground with *Ash-keys*, which have been kept the Winter in dry Sand: These will turn to very good account for *Underwood*; and the Land is already dug or plough'd for our Purpose.

One Bushel of *Ash-keys* may be worth two Shillings, the Sowing them one Shilling, and the Harrowing the Ground after Sowing will be worth five Shillings more; in all eight Shillings. The *Acorns* will come up the first Year; but the *Ash* will not spring till the second Year, unless they are old Seed: They must then be hough'd and cleans'd from the Weeds. One Man may do

do this Work in three Days, leaving the Distance of three Foot between the *Ashen Plants*. The Expence of this Weeding will be three Shillings; for I rate a Man's Work at one Shilling *per Diem*, because I suppose such *Plantations* will only be made in those Places where Land is cheap, and consequently every thing else is valuable in proportion.

The second Year we may draw some of the young *Oaks*, leaving a single *Plant* in each *Bed*. Now, it is likely that all the *Acorns* which were put into the Ground may not come up; therefore I would advise, as the surest way to have our Expectations answer'd from the *Seeds* we sow, to try the Goodness of them before they are sown; which may be done by putting them in Water, and planting only those which sink quickly to the Bottom.

An *Acre* of Land thus *ferced, dug, cleansed, and planted*, comes to twelve Pounds and eleven Shillings; and two *Acres* dress'd and planted in like manner, will cost eighteen Pounds sixteen Shillings.

But if the Land be clean enough to admit the Plough, then the Charge of *fencing, planting, &c.* of one *Acre*, will be nine Pounds three Shillings; and the Expence of two *Acres* dress'd in the same manner, twelve Pounds.

In nine Years after this *Plantation* has been made, the *Ash-plants* will be fit to cut for *Poles*; or *Hoops*, worth upon the place ten Shillings *per Hundred*. If the *Plants* stand at a Yard distance from each other, the *Acre* of Land will then contain about 4800 *Plants*, which may be sold for twenty-four Pounds. The *Quickset Fence* must likewise be cut down, and will yield about ten Load of Bushes; we will suppose them only worth

five Shillings *per Load*, although near *London* they sell for four times as much.

The whole Charge of *fencing, digging, and planting* an *Acre* of Land with *Oaks* for *Timber*, and *Ash* for *Underwood*, with the Profit of the first nine Years *Growth*, may be seen in the following *Account*.



Account

Account of the Nine Years after Planting, or first Cutting.

	<i>l. s. d.</i>		<i>l. s. d.</i>
Expence of fencing, digging, and sowing an Acre of Land for Timber and Underwood.	12 11 0	Received for 4800 <i>Aspen</i> Poles, at Ten Shillings per Hundred.—	24 00 0
Interest of the aforesaid Sum for Nine Years at 5 per Cent.	5 12 6	Receiv'd more for Ten Load of Bushes, at Five Shillings per Load.	02 10 0
Rent of the Land for Nine Years, at Five Shillings per Acre per Ann. —	2 05 0		
For cutting 4800 <i>Aspen</i> Poles, one Man five Days at one Shilling per Diem. —	00 05 0	9 Years Gain —	26 10 0
		9 Years Expence —	20 13 6
		Neat Profit of the <i>Plantation</i> in Nine Years —	05 16 6
9 Years Expence	20 13 6		

After this Cutting, we may cut again in eight Years time, and expect four or five *Poles* on each *Aspen* Plant.

*Account of the Seventeen Years after Planting,
or Second Cutting.*

	<i>l. s. d.</i>		<i>l. s. d.</i>
Rent of the Land for eight Years, at Five Shillings <i>per</i> <i>Annum</i> —	02 00 0	Received for 19200 <i>Aspen</i> Poles, at 10 <i>s. per</i> Hun- dred —	96 00 0
Expence for Cutting 19200 <i>Aspen</i> Poles (rec- koning four to each Plant) one Man 20 Days at One Shilling <i>per Diem</i> —	01 00 0	Received more for Ten Load of Bushes, at Five Shill. <i>per Load</i> —	02 10 0
17 Years Expence —	03 00 0	Gained, clear of Expences, by the first Cutting —	05 16 6
		The Interest which might be gained on 5 <i>l.</i> 16 <i>s.</i> 6 <i>d.</i> in 8 Years, at 5 <i>per</i> <i>Cent.</i> is about —	02 06 0
		17 Years Gain —	106 12 6
		17 Years Expence —	03 00 0
		Neat Profit of the Plantation in 17 Years after planting —	103 12 6

Account of the Twenty five Years after Planting,
or Third Cutting.

	<i>l. s. d.</i>		<i>l. s. d.</i>
Rent for eight Years, at Five Shillings the Acre per Annum —	02 00 0	Received for 19200 <i>Aspen</i> Poles, at Ten Shillings per Hundred —	96 00 0
Expence of Cutting 19200 <i>Aspen</i> Poles, one Man 20 Days at One Shilling per Diem —	01 00 0	Received more for Ten Load of Bushes, at Five Shillings per Load —	02 10 0
25 Years Expence	03 00 0	Gain'd clear of Expences by the Second Cutting —	103 12 6
		The Interest which might be gain'd on the a- forefaid Sum in 8 Years, at 5 per Cent. —	41 08 0
		25 Years Gain —	243 10 0
		25 Years Expence	03 00 0
		Neat Profit of the Plantation in 25 Years —	240 10 6
		To which we may add the Va- lue of the Forty <i>Oaks</i> then grow- ing in the said Plantation worth Ten Shillings per Tree —	20 00 0
		In all	260 10 6

By the foregoing Account, we find, that an *Acre* of Land, planted as I direct, may produce the Sum of 260*l.* 10*s.* 6*d.* in the Space of Twenty-five Years, clear of all Expences of Planting, and Value of the Land; and the *Oaks*, if they are still continued growing, will yet produce a more considerable Return to the Owner, or his *Family* after him.

By the Example of this *Plantation*, others may be made with different kinds of *Trees*; and if the Planter has a due Regard to the *Soils* proper to what he designs to plant, he may expect a Return for his Labour and Industry, answerable to what I have mention'd in this Account; and if his Ground happens to be already *fenced* for his Purpose, and is capable of admitting a Plough upon it, he may yet reap a much more considerable Profit from his *Plantation*.

I shall now conclude this Treatise with acquainting my Reader with what he is to expect in the second Part: I purpose in That, to treat of every Thing (so far as my Experience will permit) which may tend to the Improvement of the *Parterre*, or *Flower-Garden*; wherein I shall first give the Explanation of a new Invention for the more ready designing and laying out of *Garden-Plats*, by which *Instrument* it will be possible to produce more Variety of *Figures* for *Gardens* in an Hour's time, than we can find in all the printed Books now extant. I shall then give my Reader the best Methods of raising and propagating all Sorts of Flowers. And, lastly, endeavour to prescribe such Rules for the adorning of *Gardens*, as may make them delightful in every Month of the Year.

NEW
IMPROVEMENTS
OF
Planting and Gardening
BOTH
Philosophical *and* Practical:

CONTAINING

The best Manner of Improving Flower-Gardens, or Parterres; of Raising and Propagating all Sorts of Flowers; and of the Adorning of Gardens.

Illustrated with COPPER-PLATES.

—— *Hortos quæ Cura Colendi*
Ornaret ——— Virg. Georg.

PART II.

By RICHARD BRADLEY, F. R. S.

The SEVENTH EDITION.

LONDON: Printed for A. BETTESWORTH and
C. HITCH, J. and J. PEMBERTON, J. and P. KNAP-
TON, and D. BROWN, MDCCXXXVIII.

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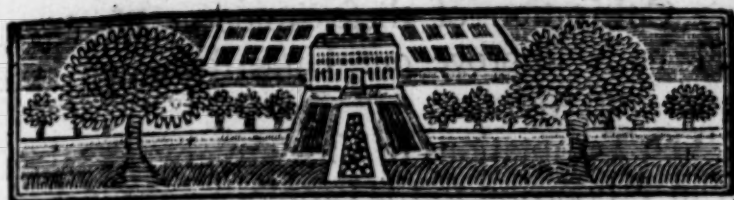
By the Author of the 'Art of Gardening'

PART II.

By RICHARD BRADLEY, F.R.S.

The Second Edition

W.D.M. Printed for A. BARNARD, Stationer and
Printer, in Pall Mall, London. 1792.
and D. BARNARD, Manchester.



To the Right Honourable

Thomas Lord Parker,

Baron of *Macclesfield*, in the County
Palatine of *Chester*, Lord Chief
Justice of *England*, and one of
His Majesty's most Honourable Pri-
vy Council.

My LORD,



OUR Lordship having been plea-
sed to think favourably of my
first Book upon this Subject, I
have presumed to inscribe this
Part to YOU, not without Be-
lief that the World will be incli-
ned to hope better from me, when they find
my Studies influenced by so great a Patronage.

It is not only from your Lordship's Inclination to the Subject of these Papers, of which none can be a better Judge than Yourself, that you are not offended with any Thing of this Kind; but that you know a
due

The Dedication.

due Cultivation of these innocent Pleasures, will both improve our Understanding, and better our Morals.

The Temptations to Vice are always taken off in Proportion to the Employments of those Minutes which are by many spent in Idleness; and the vicious and litigious Part of Mankind, whom your Lordship's just Awards correct, would be much lessen'd, if Recreations of this Nature took up more of the Time of those who have an Opportunity of spending it in Gardens.

I avoid, *My Lord*, speaking in the common Way of Dedicators, being certain that nothing can more offend YOU, than a Recital of Your own Praises. If any Thing in these Papers can be but the Entertainment of one half Hour of Your Lordship's in Your Retirement from the Sphere of Publick Business, it is the utmost Ambition of,

May it please Your Lordship,

Your Lordship's

Most Devoted, Humble Servant,

R. BRADLEY.

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Fig I

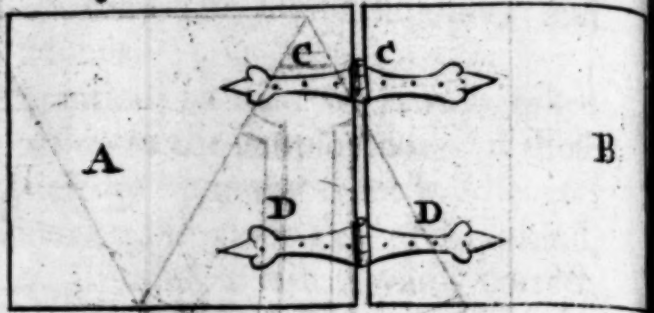
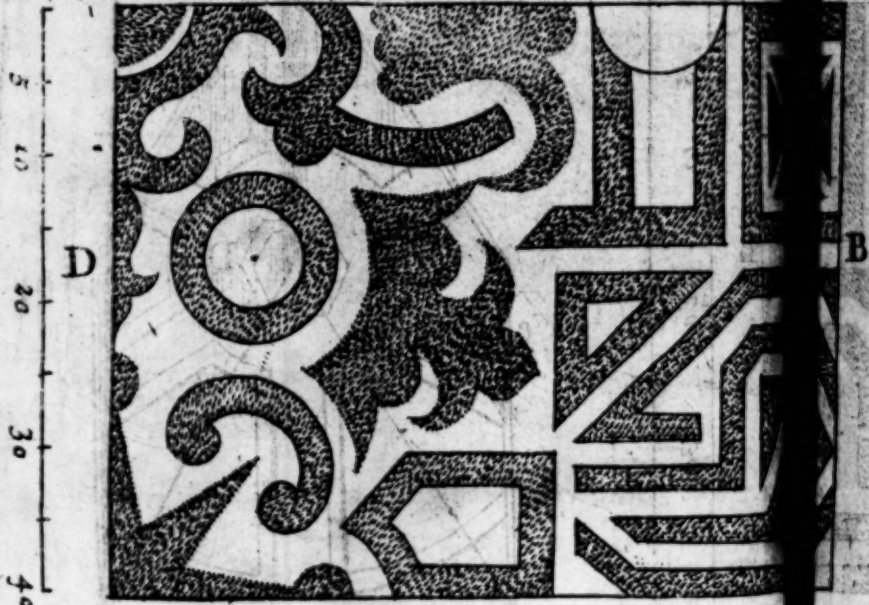


Fig III

5 10 20 30 40 50 60

A

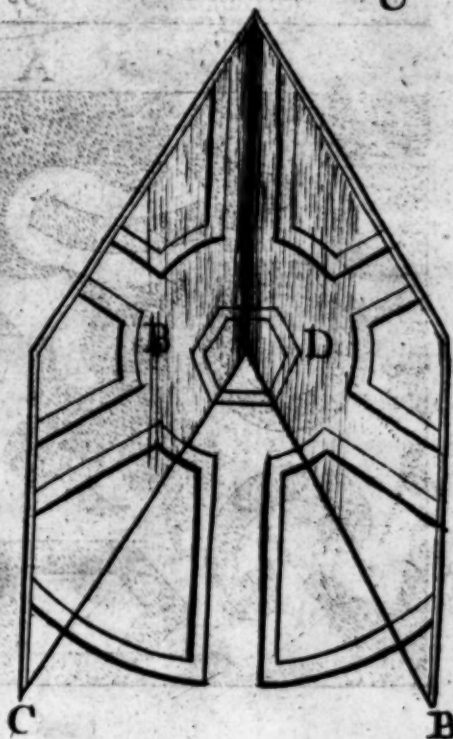


C

Fig II



A Fig III







NEW
IMPROVEMENTS
OF
Planting and Gardening,
BOTH
Philosophical and Practical.

CHAP. I.

Description and Use of a New Invention for the more speedy Designing of Garden-Plats; whereby we may produce more Variety of Figures in an Hour's time, than are to be found in all the Books of Gardening now extant.



SINCE the Instrument I now design to treat of has afforded some Pleasure to many of my Acquaintance, I have been easily persuaded to make it publick. It is of that nature, that the best Designers or Draughts-men may improve and help their Fancies by it, and may with more certainty hit the Humour

mour of those Gentlemen they are to work for, without being at the trouble of making many Varieties of *Figures* or *Garden-plats*; which will lose time, and call an unnecessary Expence, which frequently discourages Gentlemen from making up their Gardens. In short, the Charge of the *Instrument* is so small, and its Use so delightful and profitable, that I doubt not its favourable Reception in the World.

But, to proceed: We must chuse two Pieces of *Looking-glass* of equal bigness, of the figure of a long Square, five Inches in length, and four in breadth; they must be cover'd on the Back with Paper, or Silk, to prevent rubbing off the Silver; which would else be too apt to crack off by frequent use. This Covering for the Back of the *Glasses* must be so put on, that nothing of it may appear about the Edges of the bright Side.

The *Glasses* being thus prepared, they must be laid face to face, and hinged together, so that they may be made to open and shut at pleasure, like the Leaves of a Book. As for *Example*: The first *Figure* shews us the Backs of the two *Glasses* *A* and *B* joined together by Hinges, *CC* and *DD*; so that they may be open'd or shut to any Part of a Circle. And now the *Glasses* being thus fitted for our Purpose, I shall proceed to explain the Use of them.

Draw a large Circle upon Paper, divide it into three, four, five, six, seven, or eight equal Parts; which being done, we may draw in every one of the Divisions a Figure at our pleasure, either for *Garden-plats* or *Fortifications*. As for *Example*: In the second *Figure* we see a Circle divided into six Parts, and upon the Division marked *A* is drawn Part of a Design for a *Garden*. Now to see that Design entire, which is yet confused, we must place our *Glasses* upon the Paper, and open them

to the sixth Part of the Circle, (*i. e.*) one of them must stand upon the Line *b* to the Centre, and the other must be open'd exactly to the Point *c*; so shall we discover an entire *Garden-plat* in a circular Form (if we look into the *Glasses*) divided into six Parts, with as many Walks leading to the Centre, where we shall find a *Bason* of an *hexagonal figure*.

We may more plainly see how the *Glasses* ought to be placed upon the Design, by viewing the third *Figure*. The Line *A*, where the *Glasses* join, stands immediately over the Centre of the Circle; the Glas *B* stands upon the Line drawn from the Centre to the Point *C*; and the Glas *D* stands upon the Line leading from the Centre to the Point *E*: The *Glasses* being thus placed, cannot fail to produce the compleat *Figure* we look for. And so whatever equal Part of a Circle you mark out, let the Line *A* stand always upon the Centre; and open your *Glasses* to the Division you have made with your *Compasses*. If, instead of a Circle, you would have the Figure of a *Hexagon*, draw a strait Line with a Pen from the Point *c* to the Point *d* in the second *Figure*, and by placing the *Glasses* as before, you will have the *Figure* desired.

So likewise a *Pentagon* may be perfectly represented, by finding the fifth Part of a Circle, and placing the *Glasses* upon the *Outlines* of it; and the fourth Part of a Circle will likewise produce a Square by means of the *Glasses*, or by the same Rule will give us any *Figure* of equal Sides. I easily suppose that a curious Person, by a little Practice with these *Glasses*, may make many Improvements with them, which perhaps I may not have yet discovered, or have for Brevity sake omitted to describe.

It next follows, that I explain how by these *Glasses* we may, from the Figure of a Circle drawn upon Paper, make an *Oval*; and also by the same Rule represent

represent a long *Square* from a perfect *Square*. To do this, open the *Glasses* and fix them to an exact *Square*, place them over a Circle and move them to and fro till you see the Representation of the oval Figure you like best; and so having the *Glasses* fix'd, in like manner move them over a square Piece of Work till you find the Figure you desire of a long *Square*. In these Trials you will meet with many Varieties of Designs. As for instance, the fourth Figure, altho' it seems to contain but a confused Representation, may be varied into above 200 different Representations by moving the *Glasses* over it, which are open'd and fix'd to an exact *Square*. In a word, from the most trifling Designs, we may by this means produce some thousands of good Draughts.

But that the fourth Figure may yet be more intelligible and useful, I have drawn on every Side of it a Scale divided into equal Parts; by which means we may ascertain the just Proportion of any Design we shall meet with in it.

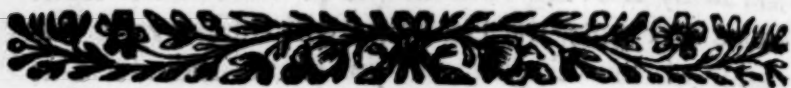
I have also mark'd every Side of the fourth Figure with a Letter, as *A, B, C, D*, the better to inform my Reader of the Use of the Invention, and put him in the way to find out every Design contain'd in that Figure.

Example I. Turn the Side *A* to any certain Point, either to the *North*, or to the Window of your Room; and when you have opened your *Glasses* to an exact *Square*, set one of them on the Line of the Side *D*, and the other on the Line of the Side *C*; you will then have a square Figure four times as big as the engraved Design in the Plate: But if that Representation should not be agreeable, move the *Glasses* (still open'd to a *Square*) to the Number 5, of the Side *D*, so will one of them be parallel to *D*, and the other stand upon the Line of the Side *C*: Your first Design will then be varied;
and

and so by moving your *Glasses* in like manner from Point to Point, the Draughts will differ every Variation of the *Glasses*, till you have discover'd at least fifty Plans differing from one another.

Example II. Turn the Side mark'd *B* of the fourth *Figure* to the same Point where *A* was before, and by moving your *Glasses* as you did in the former Example, you will discover as great a Variety of Designs as had been observ'd in the foregoing Experiment; then turn the Side *C* to the Place of *B*, and managing the *Glasses* in the manner I have directed in the first Example, you may have a great Variety of different Plans which were not in the former Trials; and the fourth *D* must be managed in the same manner with the others: So that from one Plan alone, not exceeding the Bigness of a Man's Hand, we may vary the *Figure* at least two hundred times, and so consequently from five *Figures* of the like nature, we might shew about a thousand several sorts of *Garden-plats*; and if it should happen that the Reader has any Number of Plans for *Parterres* or *Wilderness* Works by him, he may by this Method alter them at his Pleasure, and produce such innumerable Varieties, that it is not possible the most able Designer could ever have contrived.

And seeing I have given such Directions in this Chapter, as I hope may inform the Curious of the Use of this new invented Instrument, I think it may not be improper to advertise, that the Publisher of these Papers is provided with *Glasses* of several Sizes ready fitted up for the Experiment, at the following Prices; the small Sort at three Shillings, and the other at five Shillings.



C H A P. II.

Of Ever-greens, *their Culture and Use in Gardens.*

I Am in this Chapter to speak of the Culture of *Ever-greens*, and their Use in Gardens. They are so ornamental, where they are rightly managed, that I think no Garden can be compleat without them; they make beautiful and useful Hedges; and in single *Plants*, when they have been order'd by a curious and skilful Hand, they are so many growing Monuments of the Art of Gardening. But to come to Particulars, the *Ever-greens*, which are commonly propagated by the Gardeners, are *Hollies*, *Yews*, the *Laurus-tinus*, *Bay*, *Box*, *Laurel*, *Phillyrea*, *Alaternus*, *Juniper*, *Piracantha*, *Ilex*, *Arbutus*, and the *Ever-green Privet*. These have every one their proper Places in Gardens, with respect to their several Stages of *Growth*. Some of them may be kept in shape and compass with very little trouble, while others are too apt to out-grow the Care of the Gardener, let him be ever so vigilant.

S E C T. I.

O the *HOLLY*.

TO consider these singly, I shall begin with the *Holly*, which is in my opinion the most beautiful of all the rest. It will grow to a very large Tree. I have seen *Plants* of this kind above sixty Foot high in the *Holly Walk* near *Frencham*

Frencham in *Surrey*, in which Place they delight extremely; the *Soil* is dry, rather inclining to *Sand* than *Loam*. The *Holly* is a *Tap-rooted Plant*, and therefore does not love *Transplanting*, unless the *Roots* have been often pruned in the *Nursery*, by digging about it; which a careful *Gardener* will frequently do, that they may rise with a *Ball of Earth* when they are to be removed: But yet notwithstanding all his *Care*, it is adviseable to plant them in *Baskets* as soon as they are taken up, that the *Earth* which riseth with the *Roots* may not break or fall from them in the *Carriage* from one Place to another. The *Baskets* they are planted in, must be set with them in the *Places* where they are to remain, and will rot in a few *Months*, and not any ways hinder the *Trees* from drawing the *Nourishment* they require from the adjacent *Earth*, which should be natural *Soil* (without the least Mixture of *Dung*) and cannot well be too barren. The *Removal* of this *Tree* ought to be rather in *September* than towards the *Spring*, to save the *Trouble* of watering, which oftentimes puts the *Gardener* to great *Charge* and *Inconveniency*. The *Berries* of this *Plant* when they are ripe should be gather'd, and after being laid to sweat for some time, may be put in *Sand* or *Earth*, *S. S. S.* till the *Autumn* following, when they may be sown in the *Nursery Beds*. Now, as these will lie in the *Ground* for a long time before they begin to spring, I would advise the following *Method* to be made use of, in order to forward their *Germination*, and thereby to gain a *Year* at least in their *Growth*. I have observed that *Seeds* or *Berries* of this kind which have been eaten by *Fowls*, and passed through their *Bodies*, have begun to vegetate soon afterwards; we have therefore no more to do than to contrive a *Mixture* which shall have in it a *Heat* and *Moisture* resembling that in the

Bodies of Birds, and to lay the *Seeds* in it for a few Days before we sow them, which will answer the End we desire. For this Purpose therefore, provide a Bushel of *Bran*, in which, after having mix'd your *Seeds* or *Berries*, wet the whole very well with Rain or Pond-water, and let your *Preparation* remain for ten Days without any Disturbance, in a Vessel of Wood or Stone. About three Days after the Mixture has been prepar'd, it will begin to heat, and so continue to ferment for 30 or 40 Days, if it be carefully sprinkled from time to time with warm Water as it begins to dry. The Heat of this wet *Barn* will prepare the *Berries* mix'd with it, and put them into a vegetable Posture in about a Week's time after the Ferment has begun, and then may be sown in the Nursery. For this new invented artificial Heat I am beholden to the incomparable Sir *Isaac Newton*, to whom every Art is greatly obliged.

The young Stocks, which may be thus raised from the *Berries*, will be fit to graft on, or be inoculated at four or five Years *Growth*, if they are design'd to be train'd up for Ornament of our Garden. The *Grafting* must be done in *March*, and the *Inoculating* or *Budding* in *July*; but otherwise, if they should be made use for *Standard-trees* or *Hedges*, let them be planted at their proper Distances while they are very young, that they may the better accustom themselves to the *Soil* they are to grow in. *Birdlime* is made of the *Bark* of this *Tree*, gather'd about *Midsummer*, boil'd about twelve Hours in Spring-water, till the *Green-bark* separates from the others; the *Green* must then be laid in a cool Place, and cover'd with *Weeds* or *Fern* for a Fortnight, or till it become a *Mucilage*; then beat it in a Stone Mortar till it be a tough Paste, and wash it well in some running Water, and then putting it in an earthen Vessel

Vessel to ferment and purge itself for four or five Days, wash it for a second time, and put it into a fresh Pipkin, adding to it one third Part of *Goose-grease* well clarified, incorporate them on a gentle Fire, stirring your Composition till it be cold, and keep it in Urine for your Use.

Mr. *Evelyn* commends the *Holly* above all other Plants, for *Hedges* and strong *Fences*; and indeed was it not for the Benefit of *Wall-fruit*, I should prefer a thick well-grown *Holly* Hedge before any Wall that could be built; the beautiful *Green* of their arm'd *Leaves*, and the *Vermilion-colour* of their *Berries*, afford a most agreeable Prospect in every Month of the Year, and disdain the rudest Attacks of the Weather, Cattle, &c.

Having now set down what I think is the most material relating to the common or plain-leav'd *Holly*, I am to give some Account of the variegated Sorts of *Hollies*, which are so much esteem'd by the Curious, and contribute to the Ornament of our Gardens. Of these we have about twenty different Kinds, which are distinguish'd from one another by the Names of those who first discover'd them. It would be troublesome to relate them here, and would be of very little service to my Reader; since, in the whole Catalogue of them, it would be impossible to discover the Beauty or Imperfections of any one among them: Let it suffice that every Gentleman please himself, rather by examining them in the Nurseries, of which there are so many about *London*. I shall only here take notice, that there are three Sorts of *Stripes* in *Vegetables*; those whose *Leaves* are edged with Cream-colour, those edged with Yellow, and the bloach'd Sorts, as the Gardeners call them. And it is a certain Rule, that whatever Plant has its *Leaves* edged about with these distemper'd Colours, will always remain variegated, without putting forth

so much as one plain green *Leaf*; and on the other hand, such Plants as have their *Leaves* bloach'd, tinged or spotted in the middle, will seldom remain striped, if they be planted in good Ground, but from time to time will shoot out Branches entirely green, and at length lose all their other Colours: From whence we may observe that the Sap, when it appears discolour'd only towards the middle of the *Leaf*, is not then so much distemper'd, but that it may be restored by wholesome Nourishment; but that when the tinged Sap has reached the extreame Parts of the *Leaves*, so much Venom is then mix'd with it, that it is impossible to overcome it by any means; and even the *Fruit*, which is certainly fed with the most refined *Juices* of the Plant, is also equally corrupted with the same Poison, as its Stripes plainly signify.

Another Observation relating to striped Plants, is, that when a Plant begins to bloach, a skilful Gardener may provoke the Poison which begins to tinge the *Leaves*, and by checking the Nourishment of the Plant, and giving it unwholesome Diet, may by degrees unvenom the whole, and produce what they call an *Edger*, i. e. a Plant whose *Leaves* are edged with White or Yellow. Again, there is another Experiment relating to this Case, which is very well worth our notice; it was made and communicated to me by Mr. *Furber*, a curious Gardener and Nursery-man at *Kensington*; he had many Plants of the Common *Jessamine* with edged *Leaves*, upon which he engrafted Cyons of the *Spanish Jessamine*, whose *Leaves* had not been known to stripe: The Cyons of the *Spanish Jessamine*, upon their budding forth, produced *Leaves* bloach'd with Yellow, and I doubt not but they may be made *Edgers* by the same Skill; from which it appears, that when the most subtle *Juices* of
of

of a Plant are poison'd, any Plant which shall be fed from it should be envenom'd by it. It would therefore be well to sow the Seed of *Mistletoe* upon *edged-leaved* Plants, to have it with variegated *Leaves*.

What Relation these Observations may have to Animals, may be farther consider'd by those whose Studies more immediately relate to the Health and Preservation of Animal Bodies. I shall proceed to consider the striped *Hollies*, with respect to their Figure, and Use in Gardens.

The Nature of this Plant is such, that it cannot be pruned into those nice Figures, which others, whose *Leaves* are small, have been framed to; therefore I cannot propose any other Form than that of a Pyramid, or a Ball, or headed Plant. The first ought to be kept taper, ending in a sharp Point on the Top, and the headed Plants of them should be so pruned, that their Heads may resemble the Cap of a *Mushroom*, which Figure, in my Opinion, is to be preferr'd before that of a *Globe*. These Plants, if they are well train'd up, and have their *Leaves* beautifully variegated, are very ornamental, when they are mix'd skilfully with Plants of *Ever-Greens*, such as *Yews*, *Laurus-tinus*, or the like.

I have read somewhere of a pretty Invention of planting *Ever-Green Hedges*, with *Columns* and *Pilasters* of variegated *Hollies* set in them at certain Distances; which must needs have a good Effect if they are well pruned; and I think, if handsome Flower-pots were placed on their Tops, so that a healthful Branch might grow through each of them to be train'd into *Balls* or *Pyramids*, it would still contribute to the greater Beauty of the Design.

S E C T. II.

Of the *YEW-TREE*.

THE *Yew-Tree* is very slow of growth, and therefore produceth tough and hard Timber: In some Parts of *Surrey* we find some Groves of this beautiful *Ever-Green*, which consist of very large *Trees*, and seem rather to be the Produce of Nature than Art; the *Roots* are apt to break into many *Fibres*, and therefore this Plant delights in light Soil, and such as is commonly stiled barren: The coldest Mountains produce this *Tree* more readily than the richest Soils, or more gentle Exposures, so that rich Manures are to be avoided in the Culture of this Plant. The *Berries* of it, after they are clean'd from their Pulp, and well dry'd, may either be laid in Sand, as I have directed those of the *Holly*, before they are sown, or mix'd with the Bran and Water before mention'd, for their more speedy Germination. The *Leaves* of the *Yew* are so small, that it is possible to bring this kind of *Tree* into any Form we desire, as the famous *Plants* now growing in the *Physick-Garden* at *Oxford*, and that in the Church-yard at *Hillingdon* near *Uxbridge*, may certify. I have seen great Varieties of Figures very well represented in *Plants* of this sort, as Men, Beasts, Birds, Ships, and the like; but the most common Shapes which have been given it by the Gardeners, are either conick or Pyramidal. It is of great Use for *Hedges*, and makes most agreeable Divisions in Gardens: It is customary to fence in the Quarters of Wilderness Works with these *Plants*, where they have a very good Effect: In a word, there is no Difficulty in propagating this Plant, and little Hazard in the Removal

Removal of it, especially if the Roots of it are pruned from time to time by digging about it, while it stands in the Nursery. Its time of transplanting is, from *July* to *September*, or as soon as the Weather is open in the Spring-Season.

S E C T. III.

Of the *L A U R U S - T I N U S*.

THE *Laurus-tinus* is a Plant, whose Beauty chiefly consists in the Flowers which adorn it about *Christmas*, and most of the Winter-Season; it may be raised from the Berries, managed in the same Manner as those of the *Holly*; but the most expeditious way for the propagating of it, is from *Layers*, *i. e.* by laying down the youngest Branches of it in the Earth, about the Months of *September* or *October*, or in the Spring, which will soon strike Root, and afford us *Plants* fit for Use. It is a quick Grower, but very seldom makes a large *Tree*; it is often train'd up to a headed *Plant*, and introduced among *Hollies* and *Yews* into the *Parterre*: But I should rather direct that it be planted against a Wall, or in Wildernesses, where it may avoid the Knife, for the Sake of its Flowers, which an unskilful Hand often robs it of, by an untimely Pruning. It is to be noted, that this Plant, like all other Exoticks, is naturally inclined to blossom about the time of the Spring, in its own Country. I have particularly observed, that all Plants from the *Cape of Good-Hope*, make their strongest Shoots, and begin to blossom towards the End of our Autumn, which is the time of the Spring in that Part of *Africa* they were brought from; and so likewise all others, from different Parts and Climates, retain their Natural Course of Vegetation; for which

which Reason, such Exoticks should be pruned in our Spring-Season, that they may the better dispose themselves for strong Flowering Shoots in the Winter ; but more of this in another Place. The *Laurus-tinus*, altho' it is impatient of Frost, delights to grow in shady and moist Places, and flourishes well in Loam, without the Help of any rich Manure, which will forward its Growth too much, and by that Means make it too subject to feel frosty Weather ; and also to sling away its Sap in useless Shoots, which ever spoils the Blossoming of *Trees*, for the same Reason that Excess of Vigour is a Hindrance of Prolificity.

S E C T. IV.

Of the *BAY-TREE*.

THE *Bay*, although it may be raised from *Layers*, *Suckers*, or *Cuttings*, yet it grows much better if it be propagated from the *Berries* ; however for the greater Satisfaction of my Reader, I shall speak particularly of each way of raising this *Plant*. First then, if we propose to raise this *Plant* from *Layers*, we must bend down the tender Shoots to the Ground ; and after having fasten'd them in the Earth with Hooks, cover them four or five Inches with fine Earth. This Work must be done about *October*, at which time likewise the *Suckers* may be taken from about the Body of this *Tree*, with as much Root as can be got with them ; plant them in shady moist Places, in gravelly Soil without any rich Mixture, watering them well at first Planting, as all *Plants* ought to be on that Occasion, chiefly to settle the Earth close about their *Roots*. In *October* also we may set the *Cuttings* of *Bays* in Pots of fine Earth two or three Inches deep,

deep, and preserve them under some Shelter during the Winter; they will, with that Management alone, strike Root, without the Help of a hot Bed.

In the next place, if we design to raise this Plant from the *Berries*, gather them when they are full ripe: and after having spread them abroad to sweat, keep them till the *February* following in dry Sand, then sow them on a Bed of Earth fresh dug, and sift over them some fresh natural Earth, about two Inches thick. If, after this Work, the Weather happens to be moist, you may expect them to come up in about six Weeks after sowing; these Seedlings require Shelter with Straw or Fern for the three first Winters, after which they should be transplanted, lest their Roots run too deep into the Earth, and by that Means the Plants may receive Prejudice by removing them. I have seen Pyramids and headed Plants of *Bays* introduced into *Parterre* Works; but I cannot advise it, lest they should be injured by hard Weather, which often would be apt to change their Colour, and perhaps kill them. But if, by our Skill and Industry, we have been fortunate enough to train up some of this kind of *Tree* to handsome Plants, let them be put in Pots or Cases, and housed in the Winter, that their Beauty may be preserved. The finest *Trees* of this Kind that I have ever seen either in *England* or Abroad, are now in the Gardens of the *Royal Palace* at *Kensington*, which are of very great Value: However, if it should be the Desire of any one to propagate this kind of Plant, who has not the Convenience of a *Green-House*, or Place of Shelter for them in the Winter, we may plant them in *Hedges* or against *Walls*; and if severe Frosts should by chance discolour them, yet let not the Owner be discouraged; let the
Plants

Plants so injured have their top *Branches* cut off in the Spring, and they will shoot out afresh.

In *Holland* and *Flanders* I have seen the *Bay* with its *Leaves* finely variegated. Some *Plants* of it I have brought into *England*, which I have increased by ingrafting *Branches* of them upon our common *Bay*. But I yet have not ventur'd it to stand *A-broad* in the Winter.

S E C T. V.

Of the BOX-TREE.

THE *Box-Tree* is very easily propagated, either by *Slips*, *Layers*, or *Seeds*. It is a *Plant* very valuable for its *Wood*, so much used for *Mathematical Instruments*, *Combs*, and such like *Works*; and the continued *Verdure* of its *Leaves*, makes it an acceptable *Plant* to the *Gardener*. *Box-Hill* in *Surrey* shews us the *Excellencies* of this *Plant*, as well from the *Profit* of its *Wood*, as the pleasing *Shade* of the *Box-Trees* growing upon it, which are some of them so large, as to equal almost any other Sort of *Timber-Trees*. This *Plant* will make delightful *Hedges* in *Gardens*, and is, next to the *Yew*, the best *Tonsile-Tree* for the *Parterre*. As it is a slow *Grower*, and produces a small *Leaf*, it delights in chalky *Mountains*, where it will grow much quicker than it does in our *Gardens*. It is on those *Hills* where it should be planted therefore for *Profit*, tho' a natural *Soil* in a *Garden* is rather to be preferr'd, if we would keep it in *Shape*, and within *Bounds*. The best time of the *Year* to make *Layers* or *Slips* of it, is in *September*, and the *Seeds* of it may be either sown as soon as they are full ripe, or laid in *Sand* during the *Winter*, to be sown the *Spring* following.

The

The *Seeds* of this Tree, like those of the *Holly*, may be forwarded in their *Growth* by the *Bran* and *Water*.

Beside the common Sort I have been speaking of, I have seen one with variegated *Leaves*, which makes a very beautiful *Plant* for the *Parterre*, if it be kept in good Order.

The *Dwarf*, or *Dutch-Box*, is of extraordinary Use for edging or bordering of Flower-Beds, or for the making of Scrawl-Work; it will resist the most severe Weather, and remain good without renewing for above twenty Years: It is much cheaper than Border-Boards, and far more beautiful; but above all, it is to be admired on Account of the Profit it will bring to the Owner when he shall be inclined to sell it, or transplant it. This sort of *Box*, if it be earthed up every Year, may in four or five Years after Planting be taken up, and parted or split, and be made to plant about four times as much Ground as that which it stood upon. I cannot pretend to set down the Price of it, since there has not been any certain Standard for its Value. I have bought some at 6*d.* per Yard, and at another time have paid 8*d.* and a Shilling for the same Measure; but then we must suppose, that the more we pay for it, so much the more Ground it ought to plant when it comes to be split or parted.

S E C T. VI.

Of the L A U R E L.

THE *Laurel* has been used for *Hedges*, and sometimes trained up into headed *Plants*; but is of that Quickness in its *Growth*, that I cannot recommend it as a proper Companion for the other.

other *Ever-Greens* before-mention'd. I believe, with Mr. *Evelyn*, that this sort of *Plant* would do much better to be cultivated as a Standard in *Walks* or *Avenues*, where it may have full Liberty to range, without danger of the Knife. I am of Opinion this Tree will grow to a very large Size; especially when it has been grafted or budded upon *Black-Cherry Stocks*; which Experiment I have seen try'd by my curious Friend *Robert Balle*, Esq; and has answer'd very well to the Design, and keeps its Leaves all Winter; from whence we may believe, that it is not any particular Quality in the Juices of a *Plant*, which causes it to be either Ever-green, or otherwise; but that a continual Verdure rather proceeds from certain Vessels, which convey the Juices from the *Trunk* into the *Leaves* of Trees, which are more in Number, and much stronger and tougher in *Ever-Greens*, than in such *Plants* as shed their *Leaves* in Winter. But this Case I shall treat of more amply in another Place.

The *Laurel* may be propagated after the same Manner as I have directed for the raising of the *Bay*, either from the *Berries*, or by *Layers* or *Cuttings*: It loves Shade, and will thrive in (almost) every Soil: It resists the Weather, and has that Bitterness in its *Leaves*, that Cattle will not readily annoy it. But Wild-Fowl, such as *Pheasants*, *Partridges*, *Woodcocks*, *Black-Birds*, and the like, delight to shelter themselves under its Cover in hard Weather; therefore it might be planted in Parks, or other Places of the like Nature, for the Increase and Preservation of Game-Fowl.

S E C T. VII.

Of the *PHILLYREA*.

THE Nursery-Men know five Sorts of *Phillyrea*, by the following Names, the *Plain Phillyrea*, the *Bloach'd-Kind*, the *True Phillyrea*, the *Dutch silver-leav'd Sort*, and the *Gilded Dutch Kind*. The *first* or most common of these may be propagated from the *Berries*, order'd like those of the *Holly*; or it may, with the other Sorts, be raised by *Layers*, which presently take Root: It delights in a natural light *Soil*, without any Mixture of rich Compost. Both this and the *Bloach-leav'd Phillyrea* are very quick Growers, and make tolerable *Hedges*, if they be well supported with strong Rails or Stakes; but without such Helps, are not capable of resisting the Strength of the Winds; but the *True Phillyrea* is better able to defend itself against the Insults of Storms, and its slow *Growth* makes it a fit Companion for the best *Ever-Greens* in the *Parterre*. I have seen *Pyramids* and headed *Plants* of this Sort, which have equal'd in their Beauty any other of the Garden Race; but the *Plain* and *Bloach-leav'd* Kinds are with great Difficulty kept in any Form. The *Dutch Silver-leav'd* and *gilded* Sorts are valuable for the Smallness and elegant *Variations* of their *Leaves*; they may be easily trained into any Shape, but cannot abide the Frost; and therefore not so properly the Inhabitants of open Gardens, as the Places of Shelter. The Time of laying the tender Branches of these and all other *Phillyreas* into the Earth, is in *September*; by which Means we may greatly increase this kind of *Plant*.

S E C T. VIII.

Of the *ALATERNUS*.

THE *Alaternus* of the Gardeners differs from what they call *Phillyrea*, by being narrower leav'd; and from the *Privet*, by having Notches on the Edges of its *Leaves*. Mr. *Evelyn* gives us one very material Remark of it, viz. that the *Seeds* of the *Alaternus* come up in a Month's time after sowing: He directs it should be planted out at two Years *Growth*, either for *Hedges*, or to be train'd up into figur'd *Plants*. The sudden *Germination* of the *Seeds* shews it not to be a *Phillyrea*, whose *Berries* lie a long time in the Earth before they sprout: It may be increas'd also from *Layers*, treated like those of the *Phillyrea*, and delights in the same kind of *Soil*.

S E C T. IX.

Of the *JUNIPER*.

OF the *Juniper*, we have two Kinds known to our Gardeners, the *Common*, and what we call the *Swedish Juniper*; both of them resist the most severe Frost, and for that Reason, as well as for their beautiful *Green*, should have their Place among other *Ever-Greens* of the *Parterre*. The Smallness of their *Leaves* is such, that an ingenious Workman may train them into any Shape, and by often cutting or sheering them, they will be so close, that no other *Plant* can be said to exceed them in that Respect. It delights in barren *Soil*, such as *Heaths* or *Downs*, where I have seen the common

common Kind grow freely and plentifully. The *Berries* should be sown about *March*, in light Ground, without watering them, or giving them any rich Manure: They come up in two Months after sowing, and may remain two Years in the *Seed-bed* before they are transplanted, taking great care to keep them from Weeds. I remember to have heard of a *Juniper-Tree* above forty Foot high; and I think Mr. *Evelyn* has somewhere mention'd one of that sort which made an *Arbour* of eleven Foot high in ten Years time. The *Juniper* affords a most durable Fire-wood, if it be true what has been said of it, that in a Heap of its *Ashes*, which have lain a Year, some of its *Embers* have been red-hot during all that time.

S E C T. X.

Of the *PIRACANTHA*.

THE *Piracantha* has many Perfections, which are not found in other *Ever-Greens* of the *Parterre*; and yet, to my great wonder, is very little taken notice of about *London*, insomuch that I know not any one Nursery where it is cultivated. Besides the Beauty of its *Leaves*, the Bunches of white Blossoms which it produces in *May*, are very ornamental; and its *Coral*, like Beads, which hang upon it in Clusters, all the Winter, affords us a most delightful Prospect. To all these Perfections, we may add the Strength of its *Thorns*, which makes it one of the most useful *Plants* for *Hedges* that I know of. I have seen some *Plants* of this kind train'd into *Balls* and *Pyramids*, almost cover'd with the scarlet *Berries*, when Nature seem'd to rest in other things; and indeed was I to make a Winter-Garden, this Tree would be no small Contributor

butor to the Ornament of it. But let us now proceed to the *Culture* of this beautiful *Plant*: It may be raised either from the *Berries*, or from *Layers* or *Cuttings*. The *Berries*, when they are full ripe, should be order'd like those of the *Holly*, and are subject to lie as long in the Earth; but I would advise that they be given to Fowls to eat, that by passing through their Bodies, they may the sooner come up, and be better prepared to *vegetate*. In *Devonshire*, where this *Plant* abounds, it has been observed, that such Fowl as feed upon them, scatter them over the Country, where they thrive exceedingly; but are very difficult to transplant, having few *Fibres* at their Roots; therefore when they are come up, and have stood a Year or two at most, they should be planted out where they are to remain. In the Removal of this and other Trees of the like nature, we must be careful to keep the Roots from drying, before they are put again into the Ground, lest by that alone our *Plants* are often lost. If we would raise these *Plants* from *Layers*, lay down only such *Branches* as are tender, and of the last Shoot; which Rule must be observed in the laying of all *Ever-Greens* whatever; for the more woody *Branches* will not strike root by any means. About *May* or *June*, we may plant *Cuttings* of the fresh tender *Twigs* in Pots of fine Earth, watering them frequently, and keeping them from the Sun till the following Winter, at which time a warm Exposure will be helpful to them, and prepare them to make a strong Shoot in the Spring. *Plants* raised in this manner may be transplanted with greater Ease, and less Hazard, than those raised from *Seeds* or by *Layers*, as I have experienced. The *Piracantha* delights in a dry, gravelly Soil, and will grow to be a large Tree, if rightly managed, and kept from Dung or other rich Manure, which will destroy it.

S E C T.

S E C T XI.

Of the I L E X.

ALTHO' I have mention'd this *Plant* in the former Part of this Work to be a valuable Tree for Timber, yet I cannot well avoid in this place to take notice of the great Use which might be made of it in Gardens. I have seen *Pyramid Plants* of it near thirty Foot high; and there are *Hedges* of it now growing in *England* of above that Height, which have been sown but a few Years since. Such Shelter would be much more preferable than the *Dutch-elm* or *Horn-beam*, for the preserving of *Orange-trees* from the Sun, and Blasts; and might be made use of to defend our Fruit-trees from the Blights which too frequently attend the North-East Winds of the Spring. See the *Culture* of this Tree in the *First Part*. The *Cork-Tree* must be propagated after the same manner, and is much like it.

S E C T XII.

Of the A R B U T U S or Strawberry-Tree.

TH E *Arbutus*, altho' an *Exotic Plant*, thrives very well in our Climate; it is a most beautiful Tree, blossoming twice a Year, and has its *Fruit* ripe in the Winter; yet notwithstanding these Excellencies, it is little sought after, perhaps as it is a Stranger, and not supposed hardy enough to resist our *Frosts*. I have heard of it growing plentifully in *Ireland*, and have seen very large Trees of it in some Gardens about *London*. The

Plant indeed is not so well disposed to be train'd up in nice shaped *Trees*, as many others, but it makes a most agreeable *Hedge*, and is very ornamental in *Wilderness-works*. It loves a light, gravelly Soil, and may be raised either from the *Seeds* or *Layers*. The *Fruit* (which to all appearance is a *Strawberry*, but rather tasting like the Pulp of a *wild Service*) must be gather'd about *Christmas*, and laid to dry for a Month, and then bruis'd and mix'd with Sand, in order to be sown in Pots of light Earth, and cover'd about a quarter of an Inch with sifted Mould. This *Work* must be done in *March*. The gentle heat of a hot *Bed* will much help the *Germination* of the *Seeds*, which should be frequently sprinkled with Pond-water till they come up.

The most tender Shoots of this *Tree* may be laid down about *September* in fine Earth, and will strike root in a Year's time, if they are kept moist by frequent Waterings, but will not be strong enough to transplant till the Spring following, and must then be kept in the Shade for two or three Months.

S E C T XIII.

Of the Italian GREEN-PRIVET.

THIS *Plant* was brought from *Italy* by Mr. *Balle*, among other Curiosities of the like nature; its *Leaves* are not unlike those of the *Olive*; among other Names given it by the *Italians*, it is called the *Olivetta*. This *Plant*, altho' it is a quick Grower, makes an admirable *Hedge*, if it be often clipp'd; and tho' it be a Foreigner, despises the Violence of our Frosts, and maintains its Verdure all the Winter. I have not yet seen the Flowers of it, but have had many of the *Berries*, which

which somewhat resemble the *Fruit* of the *Myrtle*. We must sow the *Berries* of this *Plant* in *March*, about an Inch deep in light Earth, watering them frequently till they come up, and transplant them from the Seed-bed the second Year after sowing. I suppose a hot, gravelly Soil to be the most proper for it, having planted it in that sort of Ground, where it has made Shoots of four Foot long in one Summer.

Now, besides the *Ever-Greens* I have mentioned for *Hedges* and *figur'd Plants* agreeable to *Parterre Works*, it may not be amiss to take notice of such others as I have seen propagated by the Curious for different Uses; the *Olive*, *Lentiscus*, and the *Pistachio*, may be planted against Walls exposed to the South Sun, and will thrive very well without other Shelter. I remember to have seen perfect Fruit of the *Olive*, in Mr. *Darby's* Garden at *Hoxton*; and I think also, in the Gardens belonging to the Bishop of *London* at *Fulham*: And I am of opinion, it is a *Plant* hardy enough to maintain itself in our Climate without any Shelter; which would be very well worth our Trial. It is propagated by laying down the young *Branches* in the *Earth* about *March*.

The *Lentiscus* is a *Plant* commonly kept in Green-houses, but is sometimes planted against a warm Wall, without doors. It is raised from the *Berries*, which are brought from *Italy*, and other Places in the *Mediterranean Sea*. The *Pistachio* likewise is a *Plant* which will thrive well enough in our Climate, and may be either raised from the *Nuts*, or *Suckers*, managed as the *Ever-Greens* I have mentioned before. This last *Tree* is commonly planted against a Wall, and in that Station I have seen it bear Fruit at the late Bishop of *London's* Gardens at *Fulham*. I have seen it also growing in the Wilderness belonging to the Earl of *Peterborough* at *Parson's-Green*, where (altho' it bore Fruit plentifully)

fully) the Name of it was not known till last Year.

The several Kinds of *Firs* are likewise ornamental in *Wilderness-works*, and are beneficial in *Sylvan Plantations*: There are many Kinds of them, which are all raised from Seeds sown in *September*: They will grow in any Soil, and should have their *Collateral Buds* broke off while they are young and tender, by which means the *Timber* will be free from Knots.

In the next place the *Cypress*, *Lignum Vitæ*, and *Cedar of Libanus*, with others of the like nature, may be propagated as the former for *Wilderness-works*.

And now, as I have set down the Culture of all Sorts of *Ever-Greens*, which the Curious may desire to propagate for *Parterre* or *Wilderness-works*, I shall conclude this Chapter with a word or two concerning *Grass Turfs*, for *Verges*, or *figur'd Works*, in Gardens; which I think cannot be so properly introduced in any other Part of my Design, as in this place, seeing how much Works in Grass contribute, from their beautiful *Ever-Green*, to embellish a *Parterre*. The best Times for laying of Grass-plats are the Months of *March* and *September*, and the best *Turfs* for that Use are such as are taken from the most barren Lands, as *Heaths* and *Commons*, where the *Sword* or *Blade* of the Grass is narrow and short. To lay a Grass-walk, let the Ground be well dug and levell'd; then, after it is trodden down or beaten, or raked by a nice Hand, lay down your *Turfs* close together, and roll them with a wooden *Roller* for five or six Mornings successively, till they are well pressed, and the *Turfs* begin to strike root. By this Method a Gentleman may quickly be Master of good *Grass-walks*, or other *Grass-works*, and enjoy a continual Delight from them, especially if they lie moist, and are somewhat

somewhat shelter'd from the scorching Heat of the Sun, which is too apt to tarnish them. I shall now proceed to speak of such Flowering *Trees* and *Shrubs* as are proper for the adorning of Gardens.



C H A P. III.

Of Flowering-Trees and Shrubs, their Culture and Use in Gardens.

AS I esteem *Flowering-Trees* and *Shrubs* to be the next after *Ever-Greens*, which a curious Person would be desirous of propagating in his Garden; so in the Culture of them I shall be no less particular than I have been in the foregoing Chapter of the Management of *Ever-Greens*.

I suppose no one is ignorant that the greatest Part of these *Flowering-Trees* and *Shrubs*, which are at this time so well known to our Gardeners, are *Exotics*; and it is well worth our Enquiry what Climes they were first brought from, that for the better Embellishment of our Gardens, we may still seek after many other Varieties of the like Kinds, in those Countries whose natural State of Weather most nearly resembles the Properties of our Climate.

I find that *Plants* of *Virginia*, and even those of the *North Parts* of *Carolina*, will bear our Frosts, if they are managed with Judgment. The *Tulip-Tree*, for instance, which flourishes so well in the Earl of *Peterborough's* Wilderness at *Parson's-Green*, is a *Virginia Plant*, and yet finds no difference between the Degrees of 38 and 52. In its native Country, it is an Inhabitant of the Woods; and in my Lord *Peterborough's* Garden flourishes in a Wilderness: But I have known it planted in a much

warmer, and more open Exposure, and it has perish'd. This should be always considered by the Gardener, to plant every *Tree* in a Wood which is natural to a Wood, and upon a Plain that which is the Native of a Plain. I might here set down the most proper Method for bringing over such curious *Plants* as grow in foreign Countries into *England*, and might give some Rules for the naturalizing them when they are with us; but as I have now by me some Papers purely relating to the Culture and Management of *Exotic Plants*, which I am persuaded to make publick, I must crave my Reader's Patience till I present him with all that I know relating to that Subject, and at present only give him the necessary Direction for the Management of those *Foreigners* which are already naturalized to our Country.

The *Plants* which will make the Contents of this Chapter, as the most worthy our Care, are the *Jasmines*, *Honey-Suckles*, *Lilac*, *Syringa*, *Roses*, *Guilder-Rose*, *Brooms*, *Liburnum*, *Mizereon*, *Spireas*, *Arbor-Judæ*, *Passion-Tree*, *Sennas*, and *Tulip-Tree*.

S E C T. I.

Of the *JASMINE*.

OF the *Jasmine* there are three Sorts which bear our Frosts, known to the Gardeners, and distinguish'd among them by the Names of the common *White Jasmine*, the *Yellow Jasmine*, and the *Persian Jasmine*. The first of these is capable of resisting the most severe Weather; it is generous in its Growth, shooting sometimes more than six Foot in a Summer. It produceth its white, fragrant Flowers about *June*, and continues blossoming till *September*; it is propagated from *Layers* or *Cuttings* with great Facility, and will grow in any Soil.

The

The time of laying the young *Shoots* of this *Plant* into the *Earth* is about *September*, and at that time we may likewise plant *Cuttings* of it about a *Foot* long, always taking *Care* that two *Knots* be under *Ground*, for it is just below the *Buds* that the *Roots* spring forth, i. e. from the *Place* where the *Leaf* of that *Summer* had join'd itself to the *Branch*. This *Plant* is so delightful, that I think no curious *Person* can be without a large *Plantation* of it, either to plant against *Walls* or *Trees*, or else to train up into *beaded Plants*. I have seen this Sort of *Jasmine* planted in *Hedges* of *Dutch Elm* and *Hornbeam*, curiously intermixing itself with them, and yielding a most agreeable *Entertainment* to the *Owner*, by means of its pretty *Blossoms*, and their delightful *Odour*. When it is train'd into *beaded Plants* and kept in *Pots*, it serves to adorn the *Chimneys* in the *Summer Months*, and it is also of *Use* to ingraft the *Spanish white Jasmine* upon, or those of its own kind with *Variegated Leaves*.

The *Yellow Jasmine* has its *Leaves* more shining than the former, and its *Flowers* not much unlike those of the *Yellow Indian Jasmine*. I have seen but few *Plants* of it about *London*, altho' its *Beauty* is in my *Opinion*, surpassing the former; it is hardy enough to endure the most severe *Weather* of our *Clime*, and may be propagated from *Layers* like the other. I remember to have seen it prosper well against a *Wall* in a light sandy *Soil*; and I am apt to believe the *Indian Jasmine* might be grafted upon it as the *Smell*, *Colour* and *Make* of both their *Flowers* are so nearly the same, which seems to inform us, that the *Parts* and *Juices* of one and the other are alike; for if a *Flower* contains the most refined *Juices* of a *Plant*, and if it is allow'd that the *Odour* of that *Flower* proceeds from certain *Vapours* arising from the *Juices* contain'd in it, then it seems reasonable to believe, that when we meet

meet with Flowers of different *Plants*, which touch the Organs of Smelling in the same Manner, the *Juices* of each of them must then be alike, and the *Vessels* and *Glands* through which they have pass'd from the *Root*, must be nearly the same either in Figure or Quality, and sometimes in both.

The *Persian Jasmine* bears Flowers of a Purple Colour, but seldom makes a large *Plant*; it will bear the Weather, and make a pretty Show in Wilderness Works, among other flowering *Shrubs*; it may be raised from *Layers* or *Suckers*, and loves a light *Soil*; also it may be budded upon the *Lilac*.

S E C T. II.

Of the *WOODBIND*, or Honey-Suckle,

THE Gardeners cultivate several kinds of *Honey-Suckles*, distinguish'd among them by the Names of the *Forward Blowers*, *Later Blowers*, *Scarlet Flower'd*, and *Ever-Green Honey-Suckle*; these are all of them *twining Plants*, and are raised from *Layers* or *Cuttings*, order'd like those of the *Jasmine* in *September* or *October*; they love Shade, and are the Natural Inhabitants of Woods, where the Neighbouring Trees serve them for their Support; some or other of them shew us their *Blossoms*, and perfume the Air with their fragrant Odours, throughout the whole Summer, and therefore it would be needless for me to advise a Gardener to provide himself with every Variety of it which I have mentioned. The *Flowers* are in themselves beautiful, and as the Plant is a quick Grower, let it be planted about Trees in Avenues, to intermix its *Blossoms* among the *Branches* of such as the *Ebn*,
Oak,

Oak, and the like. Now altho' the *Honey Suckle* is a *twining Plant*, like the *Jasmine*, yet it may be train'd up into a *Standard*, and has an admirable Effect, as a *beaded Plant*, in the most remote Parts of *Parterre Work*; for to plant it among *Ever-Greens*, in or about the Center of such a Garden, would wound the Prospect for many Months of the Year, when it was vacant of Leaves.

If I may be allow'd to direct the Fancy of other People, I would advise that every Sort of Flowering *Shrub* should be train'd into *beaded Plants*, and planted in Garden Pots, that when they are in *Flower* they may be set in the Borders between the *Ever-Greens*, and removed as soon as their *Blossom* is over, to make Room for others.

S E C T. III.

Of the *L I L A C*.

OF the *Lilac* there are two Sorts, commonly known to the Gardeners by that Name, viz. the *Blue* and the *White*. The *Botanists* indeed call the *Lilac* by the Name of *Syringa* or *Pipe-Tree*, but the Gardeners give the Name of *Syringa* to another *Plant*; therefore as my Design here is chiefly dedicated to the Use of Gardeners, I shall call every *Plant* by the Name they know them by, and at the End of my Work endeavour to reconcile the *Botanist* with the *Gardener*, by an *Index* of Names in *Latin*, *English*, and other *Languages* now in Use. The *Lilac* then is a *Plant* which grows to a pretty large *Tree*, bearing its Bunches of *Blue*, or rather *Purple Blossoms*, like *Plumes of Feathers*, in *May*: I know not any Sight more agreeable than this *Tree* when it is full of *Flowers*, and altho' it is very common, is well worth our propagating. Small Walks

Walks of these *Trees* are very pleasant, and they are no less Ornamental in the Quarters of *Wilderness Works*, especially if the *White Flowering Kind* be judiciously intermix'd with them. They may be raised by laying down the young *Branches* in *March*, or by taking off the *Suckers*, and planting them in a light *Soil* in the same *Month*, or about *September*.

S E C T. IV.

Of the *SYRINGA*.

THE *Syringa* has two Qualities, which were taken Notice of by that learned and curious Botanist Dr. Compton, the late Bishop of London, viz. that the *Leaves* tasted like *Green Cucumbers*, and the *Blossoms* had the Odour of *Orange-Flowers*. This *Shrub* is propagated as well for *Wilderness Quarters* as for headed Plants, and is often planted in Pots to adorn Chimneys in the Summer. They produce their Bunches of fragrant white Blossoms in *May*, and continue blowing for six Weeks. I have not yet try'd to raise them from *Seeds*, nor indeed would it be worth while, seeing how apt the *Root* is to put out *Suckers*, which may with great Ease be taken off about *March* or *September*, and transplanted. The *Syringa* will grow almost any where, and if planted in a shady Place will shoot vigorously; but being much exposed to the Sun, will produce *Flowers* in great Abundance.

S E C T. V.

Of the ROSE-TREE and its Kind.

WE have more Variety of *Roses* propagated by our Gardeners, than of any Flowering-Tree or Shrub; the Flowers are most delightful for their agreeable Odour and Beauty. I have seen one or other of them Blossoming for ten Months of the Year, without using any great Art to alter the natural Season of their Blowing. The Gardeners distinguish them by the following Names; first, the *Cinnamon Rose*, which is the most forward Blower: The *Monthly Rose*, and the *Cluster Monthly Rose*, which, if they happen to be planted against a warm Wall, will begin to blow about the latter End of *March*, or the Beginning of *April*, and continue to produce Flowers for almost three Months; and if after they are out of Flower, they have the Tops of their Branches pruned off, we may expect a second Crop of *Roses* from the same Trees in *Autumn*, which will continue their Blossom almost till *Christmas*, if the Weather be open. The next after these is the *Damask Rose*, which will begin its Blossoms in *May*, and continue Flowering for above six Weeks. The *Rosamundi*, or *York and Lancaster Rose*, with the *White*, *Red*, and *Yellow Roses*, begin their Blossom somewhat later than the *Damask*. And last of all, the *Centifol* or *Province Rose*, shews us its surprizing Flowers; but besides the several Sorts which I have here set down, there are many others which I have not yet seen. That curious and incomparable Patroness of Botany, the late Dutchess of *Beaufort*, has told me of sixteen different Sorts, which her Grace cultivated in her Gardens at *Badminton*; but altho' the several

veral Sorts of *Roses* differ in their Times of *Flowering*, yet are they all propagated after the same manner; they love a strong holding Ground, and delight so much in moist Places, that they will even grow in Water: They may either be raised from *Layers* or *Suckers*; the first may be lain down in *September*, and the *Suckers* may be taken from the old *Roots* in that Month, or about *March*, and transplanted immediately before their *Roots*, which have but few *Fibres*, grow dry; but in case Necessity obliges us to keep them out of the Ground for some time, lay their *Roots* in Water for five or six Hours before *Planting*. The *Rose-Tree* may be either cultivated for the Quarters of Wilderness Works, to be planted there among other *Flowering Shrubs*, or train'd up into *Standard Plants* for *Pots*.

S E C T. VI.

Of the *GUILDER-ROSE*.

THE *Guilder-Rose* bears its Bunches of *White Blossoms* (as big as a large *Tennis-Ball*) in *May*. The *Plant* seldom rises very high, or is capable of being kept in a regular Form, therefore is chiefly propagated for *Wildernesses*, or other wild Places. It delights in a holding Land, and may be raised from *Suckers* taken from about the old *Roots*, either in *March* or *September*. I am told that this *Plant* may be grafted upon the *Elder*.

S E C T. VII.

The *SPANISH-BROOM*.

THE *Spanish Broom*, altho' there is no great Beauty in its *Leaves*, yet the *Spikes of Yellow Flowers*,

Flowers, which it puts forth in *June*, makes it a *Plant* very desirable in our Gardens. It is an irregular *Plant*, by no means to be brought into any Form by the Gardener. It may be planted in Wilderness Works with other Flowering *Shrubs*, among which it makes a great Shew. We may raise it from *Seeds* sown in *March* in light Earth; and also by laying down the tender Branches in the same Month, and cutting them at the Joints, after the Manner of *Carnation Layers*: But this last Way is not so certain, and more troublesome than the raising of them from *Seeds*.

I cannot forbear taking Notice in this Place of the common *English Broom*, and the *Furze-bush*, as *Plants* well enough worthy our Care; the first to mix with the *Shrubs* of the Wilderness, and the other to be trained into *Figured Plants*; these are both raised from *Seeds* sown in *March*, and will not bear transplanting after they are one Year old, without great Care. I have seen some *Plants* of the *Furze-Bush* cultivated in Gentlemens Gardens, not any ways inferior to the Beauties of the most valuable *Ever-Greens*. It is conside as the *Yew*, and in my Opinion exceeds it in one Respect, i. e. that it blossoms in all Seasons of the Year; and was it not so common, I doubt not but it would be more frequently planted in our Gardens than any other *Ever-Green*. If it be kept well cut, it makes most beautiful and impenetrable Hedges.

S E C T. VIII.

Of the LABURNUM.

THE *Laburnum* is an agreeable *Shrub*, or rather a little *Tree*. I have seen it above twenty Foot high, cover'd with its beautiful Strings of yellow Flowers in *May* and *June*, and yielding

Plenty of Fruit, which ripens about *September*. This Plant resists our severest Frosts, and will grow in the most open Exposure, as well as under the Shade of large *Trees*: It is commonly planted among the other Flowering *Shrubs* of the Wilderness, and may be easily raised from the *Seeds* sown in *March*, and transplanted without Difficulty two Years after it is come up.

S E C T. IX.

Of the MEZEREON.

THE Gardeners know two Sorts of *Mezereon*, viz. that with the *Red Flower*, and the *White Flowering Sort*: The first is common enough in every Garden, but that with the *White Flower* is rare; they are both of them *Dwarfs*, seldom rising higher than three Foot, but have two Excellencies which make them more valuable than much taller *Trees*: Their *Stalks* are cloathed with the *Flowers* in *January*, and the Air is then perfumed with their delightful *Odours*: They remain a long while in *Blossom*, and are afterwards no less beautifully adorn'd with their *Fruits*. I know no other way of propagating them, than by sowing the *Seeds* in *March*, if you can save them from the devouring Birds which delight in them. I have eat some of the *Berries*, which were not unpleasant to the Taste, but about an Hour after I had swallow'd them, I found an extraordinary Heat in my Throat, which caused a violent burning Pain for above twelve Hours. It would be well enough worth our Enquiry, Whether the *Seeds* of all forward blowing *Plants* are not hot, in proportion to those of the *Mezereon*? and, whether their extraordinary Heat is not one Means of their early
Sprouting?

Sprouting? This *Plant* may well enough be introduced into the *Parterre*, as it is a slow *Grower*, or in *Wilderness-works* for its delightful *Blossoms*, but chiefly into a *Winter-garden*. A loamy *Soil* is most proper for it.

S E C T. X.

Of the *SPIRÆA FRUTEX*.

THIS *Plant*, known to the *Gardeners* by the Name of *Spiræa Frutex*, blossoms about *August*, yielding *Spikes* of *Flowers* of a *Pink-colour*: The *Shrub* seldom exceeds three *Foot* in height; it is beautiful in its *Flower*, and is a *Plant* which should not be wanting in a *Garden*. It may be propagated from *Suckers* taken off in *March*, and planted in a light *Soil*.

S E C T. XI.

Of the *ARBOR JUDÆ*.

THIS *Plant* is very common in the most *Southern* Parts of *Europe*, but I have received the *Seeds* of it also from *America*, (I think from *Virginia*.) I have sown them in *March*, and raised great numbers of them, and they are now common enough in most curious *Gardens*. This *Plant* will rise very high, even to a pretty large *Tree*; but is more frequently planted against a *Wall* with us, than in the open *Ground*. It bears its beautiful *Rose-colour Blossoms* in *Clusters* about *March* or *April*, even before the *Leaves* are open'd. *Dr. Compton*, the late learned *Bishop* of *London*, eat of the *Flowers* in his *Sallets*, and had a very large *Plant*

of it against a Wall in his Garden. The *Plant* is hardy enough to resist our Frosts, and I doubt not but would do well in *Wilderness-works*, among other flowering *Shrubs*. It loves a loamy Soil.

S E C T. XII.

Of the *MARACOC*, or *PASSION-TREE*.

THERE are several Sorts of *Passion-Trees*, some of them *Ever-Greens*, others *Perdisfoli*, others dying to the Root every Winter, and others which are annual *Plants*. I have reckon'd near thirty Sorts of them at the Physick-Garden at *Amsterdam*, where were the greatest Varieties of them that ever I have seen. But as it is not my Purpose here to particularize any sort of *Plant*, which is not capable of resisting the Weather of our Climate without Shelter; so I shall only take notice of one Sort, commonly known to our Gardeners, and endeavour to rectify a Mistake concerning the *Passion-Tree*, which I believe many are possess'd of. It is said that we have at least two hardy Kinds of them in *England*, viz. the Fruit-bearing-kind, and the common Sort, which bears no Fruit; but this is a Mistake, they are both one, but the Difference of Culture makes one barren, the other fruitful; But before I proceed to set down the Culture of this *Plant*, it may perhaps be expected I should say something of the *Flower* and *Fruit*, which are so remarkable, as well for their singular Beauties, as for the strange Account given of the *Flower* by the *Spanish Friars*, upon their first Discovery of it in the *West-Indies*. The *Flower* is about four Inches over when it is full-blown; it has ten white *Petals*, within which are placed round
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Passion Flower & Fruit





about the Bottom of the *Stile* two Rows of *Stamineous-like* Threads of a *purple* Colour; the *Stile*, which somewhat resembles the Pedestal of a Pillar, divides itself on the Top into three Parts, which turn their Mouths towards the Bottom of the *Flower*; they are of the Colour of *Indigo*: Besides these three *Tubes*, just below that Part of the *Stile* where they unite, are placed five *Stamina*, spreading themselves in a Star-like Figure, with yellow *Apices* on their Points. At the Footstalk of every *Flower* is a *Whirle* or *Clasper*, and to that is joined the *Leaf* of the *Plant* deeply cut on the Edges, as here represented. It is called the *Passion-Tree*, for that by the Contrivance of the *Friars*, who, in a counterfeit Figure of it, when it was first discover'd, added some things wanting in the natural *Flower*, they made it, as it were, an Epitome of our Saviour's Passion. The Story perhaps, as I have it, may not be unacceptable to my Reader: The ten *Petals*, say they, represent the ten *Apostles*, and at the same time put the Question; that there were twelve: But they answer, That *Judas* had hang'd himself, and *Peter* had deny'd his Master. The *Stamineous-like* Parts which spread themselves on the *Flower*, they liken to a *Glory*; and the small *purple Threads* which stand round the Bottom of the *Stile*, is a supposed *Crown of Thorns*. The *Stile* which is in the Middle of the *Flower*, serves them for the *Pillar*, to which, they say, the *Jews* bound those Malefactors whom they scourged; and that they may not want any part of the Story, they turn the *Clasper* into a *Cord*, and the *Leaf* into a *Hand*. The three Divisions on the Top of the *Stile*, they turn into three *Nails*; and taking off one of the five *Stamina's* with its *Apex*, call it a *Hammer*, and the four others remaining make a *Cross*; the three *Alabastries* at the Bottom of the *Flower* are said to represent the three *Soldiers* who cast lots;

and the Time between the *Opening* and *Shutting* up of every *Flower* being just *three* Days, is enough to compleat the Story. Thus superstitious Persons *semper sibi somnium fingunt*. The old Herbalists have mention'd somewhat of this Story, but I found it mightily improved when I was at *Brussels*, even beyond what I have here mention'd.

But, to proceed to the Culture of this *Plant*: That it may bear Fruit, we must plant it in very moist and cool Places, where it may be continually fed with Water: This I learn'd from a Letter from the *West-Indies*, wherein it was made an Inhabitant of *Swampy* Places. I have since that time seen a Tree of this sort with above three hundred ripe Fruits upon it, at Mr. *Greening's*, Nursery-man at *Brentford*, which was planted in Cow-dung, and had, from time to time, the Place about it renewed with the same cooling Soil: And likewise it has ripen'd Fruit at Mr. *Fairchild's* at *Hoxton*, whom I have so often had occasion to mention. The Fruit were shaped like Lemons, and of the same Colour; they were filled with a beautiful red Pulp and Seeds, like the Fruit of a Pomegranate, and were not disagreeable to the Taste: But the largest Fruit of this *Plant*, which I have yet seen, was sent some time since to the *Royal Society*, by a Curious Gentleman, I think, living somewhere in the *West* Part of *England*, with an Account of his Method of raising them. He had a large *Tree* against one Side of his House, which happening to grow over a Drain which went from his Kitchen, and lay so shallow, that the Roots of this *Passion-Tree* found their way into it, the *Tree* then began to produce Fruit.

From these Observations, I was inform'd of the most proper Way to cultivate this *Plant* for the Production of its Fruit; and the Directions I have given to several of my Friends to lay plenty
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of Cow-dung about the Roots, and even then to keep it frequently water'd in the Flowering Season, has been sufficient to shew them Fruit enough to satisfy their Curiosity.

We may raise this *Plant* either from the Seeds sown in *March*, or by Layers in the same Month; and every Cutting of it about *May* or *June*, will strike root, if they be planted in fine Earth. It is so quick in its Growth, that I have seen some Branches of it about 18 Foot long in one Summer, and is so hardy, that the most severe Frosts of our Clime will not destroy the Roots, altho' perhaps the *Plant* to all appearance has perished above Ground. In the last great Frost, I began to despair of two very large *Plants*, which stood abroad, and were even cut down to the Ground, without hope of Recovery; but the *May* following, from the Fibres only which remain'd, there sprung up above 50 small *Plants* from each Root. We must remark, that it is only the small Shoots of this *Plant* that produces Flowers; so that in the Nail-ing and Pruning of this *Tree*, we must be sure to leave some of these to have early Blossoms; for 'tis from the early Blossoms we may only expect Fruit.

S E C T. XIII.

Of the S E N N A.

THERE are several Kinds of *Senna* distinguish'd by various Names among the Gardeners; but there are only two Sorts of them which are commonly known and made use of, viz. the *Scorpion Senna* and the *Bladder Senna*: The first is, in my Opinion, the most beautiful, and deserving of our Care, the *Blossoms* shewing them-

selves as well in Autumn, as in the Spring Season: They both make pretty *Shrubs* for Wilderness-works, and may be propagated for that Use, either by sowing the *Seeds* towards the latter End of *March*, or by *laying* down the tender *Twigs* in the Earth, in *April* or *May*; which soon strike *root*, and may be transplanted without difficulty. They love a *loamy Earth*, and grow well in the *Shade*.

S E C T. XIV.

Of the TULIP-TREE.

I Have already said something of this *Tree* at the Beginning of this Chapter, especially concerning that now growing at my Lord *Peterborough's*. It is a *Plant* of the Wood, and will not prosper abroad in a more open Exposure; which I repeat, because it is seldom that our Gardeners regard that Nicety in the Culture of *New Plants*. The *Tulip-Tree* should be set among such *Trees* as are design'd for Groves; it will rise to as great a Height as any of our Timber *Trees*. Its *Leaves* are somewhat like those of the *Maple*; and its Flowers, which begin to open in *July*, are only found at the Extremities of the Branches. They have some small Resemblance of a *Tulip*, but not enough, I think, to give the Name to the *Tree*. The *Petals* are of a yellow Colour, somewhat variegated with Vermilion; the Fruit, which succeeds them, is like the *Cones* of the *Fir-Tree*, but does not come to perfection in *England*: However, as we frequently receive good *Seeds* of it from *Virginia* and *Carolina*, I shall give my Reader an Experienced Method of raising them; for it is very difficult to propagate them from Layers.

Mr.

The Flower of the Tulip Tree.

Fig. I.

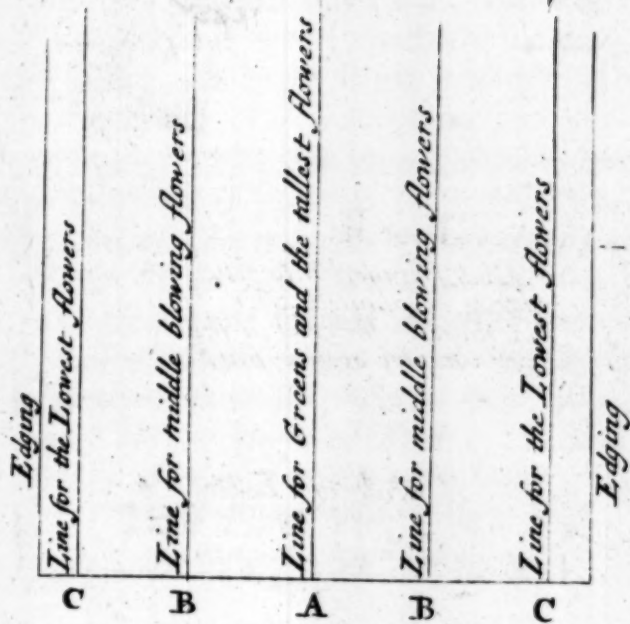
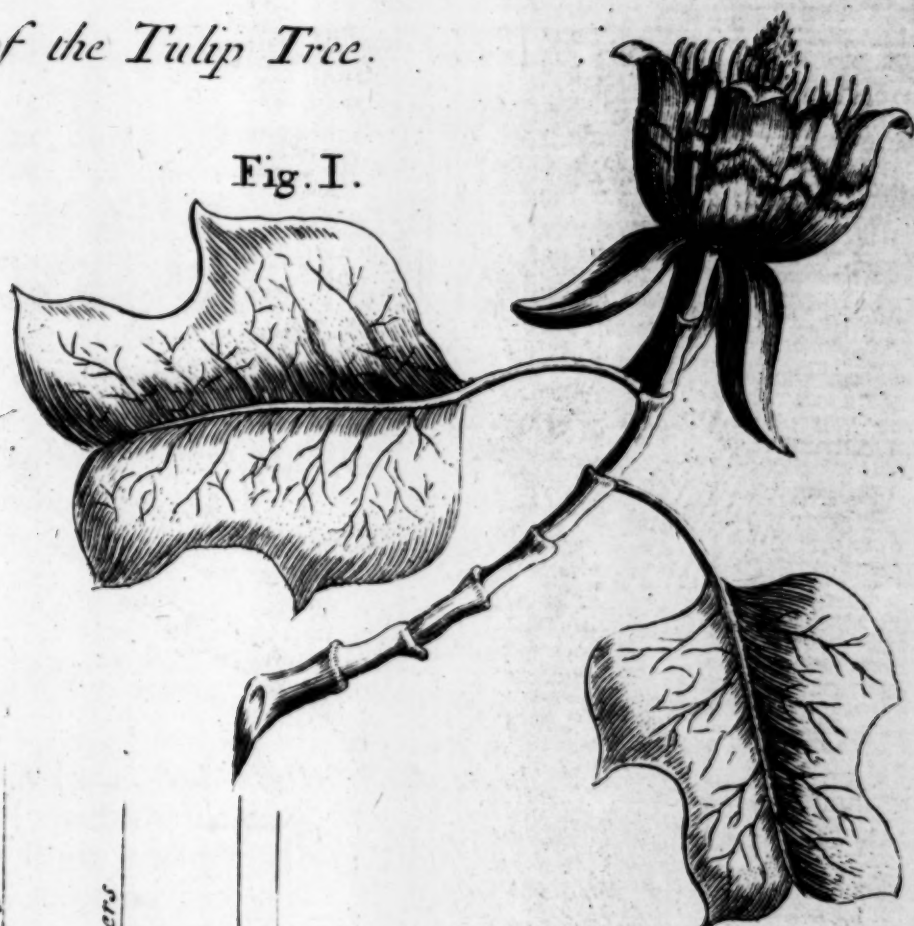


Fig II

A Bed Divided into five parts to be planted after the manner directed in the Last Chapter of this part.

A Scale of Feet

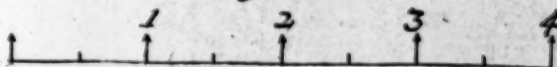


Plate 5 Pag. 102 p^t 2. d



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Mr. *Fairchild* sowed the Seeds of them in Pots, about *August*, and set them under Shelter all the Winter; the Spring following they came up without the help of a hot Bed. This Time of sowing the Seeds is necessary to be observ'd; for I have often try'd them in the Spring, but could not raise them at that Season. The young *Plants* may be transplanted into single Pots at two Years Growth, and must have Shelter in the Winter for the first nine Years at least, till they have Strength enough to resist the Severity of our Frost; they may then be planted in the natural Ground, as I have directed, but rather in a sandy Soil than any other.

S E C T. XV.

Of the POMEGRANATE.

WE know two Sorts of this *Plant*, viz. that with the single Flower, and the double Blossom-kind: They are both hardy enough to withstand the Severities of our Winters, and are propagated by laying down the young Shoots in *March*. The Blossoms of each of them are of a most beautiful scarlet Colour, the single ones setting frequently for Fruit, and sometimes ripening with us. I have seen some headed *Plants* of each Sort; but I rather advise them to be planted in Hedges or Wilderness-works, where they may be in less danger of the *Knife* or *Shears*. Some have made *Arbours* of them, which have been extremely pleasant. These *Plants* love a light Soil, and may be transplanted either in the Spring or Autumn Season.

S E C T. XVI.

Of the ALTHÆA-FRUTEX.

WE find two Sorts of this *Plant* (commonly) in the Gardens, differing from each other in the Colour of their Flowers, the one white, and the other purple: They may be propagated from Layers in *September*, or Suckers taken from about the Roots at that time, and likewise from the Seeds sown in *March*, and are used chiefly in Wilderness-works. The Blossoms appear in *August* in great numbers, and afford a delightful Prospect: They will grow in any Soil, with little trouble to the Gardener.

S E C T. XVII.

Of the Double-blossom'd Virgin's-Bower, the Maxechitle, or Scarlet Jasmine, Perwinkle, and French Willow.

THE first of these, *i. e.* the *Virgin's-Bower*, may be raised from Layers in *September*, and some say, from Cuttings likewise: The Flowers are of a Violet-colour, and appear in great numbers, almost covering the *Plant*: It loves a light Soil; and as it is of a twining nature, must be supported with Stakes. It may either be planted against a Wall, or set among the other Flowering Inhabitants of the Wilderness.

The *Maxechitle*, or *Scarlet Jasmine*, is by some Gardeners called the *Trumpet-Flower*: It is also a twining *Plant* like the former, and may be raised either from *Layers* or *Cuttings* in *September*. The
Flowers,

Flowers, which it produces in abundance about *May* or *June*, are rather of an *Orange* Colour than a *Scarlet*; it is commonly planted against Walls, tho' I am apt to believe it might maintain itself in *Wilderness Works*, or more open Places. This also loves a light *Soil*, and frequent Waterings in the Summer Season.

There are several Sorts of *Perwinkle* cultivated by the Gardeners; it is a creeping *Plant*, easily striking *Root*, if it be laid in the Earth about *March*, or will grow of *Cuttings* planted in *September*. Its pretty *Blue Flowers* make an agreeable Shew in the Summer. This *Plant* indeed hardly deserves the Name of a *Shrub*; but as it is not strictly of the *Herbaceous Race*, I take the Liberty to speak of it in this Chapter; and because, when it is ty'd up to Stakes, it may very well be reckon'd a fit Companion for *Flowering Shrubs*: This, with the rest, may be planted in *Wilderness Works*, and in *Pots*, (for the Ornament of *Parterres*) to prevent the too great Increase of its *Suckers*, which would be apt to over-run the Borders. It delights in moist Ground and Shade.

The *French Willow* is also one of the Dwarfs of this Chapter, and is rather a greater Increaser than the former, produces incredible Numbers of *Suckers* about the *Root*, which may be taken off and transplanted, either in the *Spring* or *Autumn* Seasons: If we plant it in *Wilderness Works*, it will soon over-spread the Ground; but if it be desired in the *Parterre* for the sake of its pretty Pink-colour *Flowers*, the *Roots* must be confined in *Pots*.

Thus I think I have mentioned every sort of *Flowering Shrub* and *Tree* known to the Gardeners, and have given such Directions for their *Culture* and Management in Gardens, as I have myself experienced. I might indeed have added to them
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the *Barberry* and *Almond*, which produce such agreeable *Flowers*; but as those *Trees* are chiefly celebrated for the *Fruits* they bear, so I shall not take any further Notice of them, till I speak of *Fruits* in general. I shall conclude this Chapter with taking Notice once more, that every one of the *Flowering Shrubs* I have mentioned, may be cultivated in *Garden Pots*, and so placed from time to time, as they *blossom*, in the *Borders*; by which Method a Gardener may change the Face of his *Parterre* every Week, and supply it constantly with fresh Beauties.



C H A P. IV.

Of the Perennial Flowers, the tallest Blowers.

I Intend in this Chapter to speak of such *Flowers* as remain for many Years in the Ground, *Growing, Blossoming, and Increasing*; and as they are most of them such as will rise to a considerable Height, are therefore the most proper to be planted in the middle of *Borders*, and chiefly in large Gardens. I shall set down, as near as I can remember, their several Heights, and recommend that they be planted in Places proportionable to their several Altitudes, that if it is possible one may not find such intolerable Mistakes as are frequently committed in many Places, of planting *Dwarfs* in the midst of a *Border*, and some of the most Gigantick Kinds of *Flowers* for *Edgings*; but that in the planting a *Border* or *Bed* of *Flowers*, we may judiciously mix the several Sorts, so as to have not only some of them in *Blossom* every Month

Month of the Year, but that they may be so disposed as to appear gradually one above the other, and add Beauty to each other by their Variety of Colours; for which End I shall add a Figure of a Bed of Earth four Foot wide, divided in the Manner I propose, and set down the proper *Flowers* allotted for each Division of it, when I have mentioned the several Sorts, and their *Culture*.

S E C T. I.

Of the HOLYROCKS.

THIS *Plant*, as it is always rais'd from *Seeds*, so are the *Flowers* commonly different from each other. I have seen about ten several Sorts of them in one Garden, which if the System of the *Generation* of *Plants* be true, may happen from accidental couplung of one with the other: Their *Flowers* are commonly double, and so cannot perhaps be very easily impregnated with other *Farina* than their own, otherwise we might have had many more Varieties of them: However, as they are, they neither want Beauty nor Stature, seldom bearing their Flower Stems less than six Foot high from the Ground, which are commonly garnish'd with their Rose-like *Blossoms* above half their Height. Their *Seeds* are sown in *March* in the natural *Earth*; and tho' they do not lie long in the Ground before they come up, yet they produce no *Flowers* till the following Year. They may be transplanted about *September* or *March*, and will begin to flower in *July* or *August*: They require a rich *Earth*, and frequent Waterings in the Summer, to make them large. These remain good several Years, and may for their Duration, as well as their Magnitude, take place among

among the Flowering Shrubs in Wilderneys-works, or be planted in Lines in Avenues of Trees, where Cattle cannot come to destroy them; sometimes in the most remote or open Parts of large Gardens, where their *Red, White, Purple, or Black* Flowers, afford a beautiful Prospect. They die to the Ground every Winter, and shoot out again the following Spring; and I am inform'd, that some have increas'd them by parting their Roots in *March*.

S E C T II.

Of the Perennial Sun-Flower.

THIS *Plant* blossoms about the same time with the former, and will bear its *Flower-stems* near six Foot high, if it be encouraged with rich Earth, and well watered in the Summer Months. The yellow *Flowers* which it produces, resembling so many *Stars*, are very delightful, but are not so large as those of the *Annual Kind*. It may be propagated from *Seed* sown in *March*, or *Slips* of the *Root* taken off at that time, and transplanted. The Summer *Shoots* of this *Plant*, like those of the former, always perish at the Approach of Winter, and are succeeded by others in the following Spring. It will grow in the Shade and almost any Soil, and is even capable of resisting the Smoke of *London*, where it is often cultivated in Pots. It may be planted as a Companion with the *Holyock*.

S E C T. III.

Of the Asters or Star-Worts.

TH E Curious Botanists reckon about twenty Sorts of *Star-worts*; and I think I have seen the Figures of about 15 different Kinds of them. Their several Names and Descriptions would be tedious to my Reader: And since they are all propagated after the same manner, the mentioning only of two Sorts, which I esteem to be preferable to the rest, may suffice for the Instruction of any Planter.

That Sort which is the tallest of the two, which I shall recommend, is known to the Gardeners by the Name of the *October-Flower*: It bears its *purple* Flowers about *October*, upon *Stalks* of about four Foot from the Ground, and is not inferior in its Beauty to any Flower in the Spring. I cannot forbear taking notice in this place, that the Flowers of the Autumn Season are inclining to the darker Degrees of Colour; this and other *Asters*, which blow late, produce *purple Blossoms*; the *Saffron-Crocus* has purple Flowers, and the Autumn *Cyclamen* is tending to that Colour; *Stock-July-Flowers*, which blossom about the End of the Year, are all inclining to Purple; and the *Colchiums* likewise, which are Autumn-blowing Flowers, are stain'd with the same Colour. I think it would be well worth the Enquiry of the Curious, whether this Purple, which reigns in the Autumn among Flowers, does not proceed from the Quality of the Earth at that Time, whose purest Juices are then exhausted. But, to return to the Culture of this *Aster* or *October-Flower*: It is so apt to increase in its Roots, that without it be confined in Pots, either as I have directed for the foregoing *Plants*, or

as

as a most Curious and Learned Gentleman in the Art of Gardening, *Samuel Reynardson Esq;* of *Hillingdon*, has been used to plant it (in Pots without Bottoms) it will quickly over-run the Ground; every *Slip* taken from the Root in *March* will grow in any Soil or Exposure, and make a good Shew that Year. It is a fit Companion for the tallest Flowers.

The *Italian Star-wort* is the other Sort which I would recommend to the Gardener; it produces its Purple Flowers in *August* and *September* upon Stalks of about two Foot high, this may be managed like the former; but as it is of a lower Stature, should be planted in lesser Gardens, and smaller Works than the other.

S E C T. IV.

Of the Everlasting P E A.

THIS *Plant* is likewise durable, and may very well be placed among the tallest *Plants*; it is raised from Seeds sown in *March*, but does not Blossom till the second Year after sowing. The *Flowers*, which are of a *Peach-bloom* Colour continue Blowing for above two Months. Doctor *Grew* tells us, that the Blossoms of this *Plant*, if they are steeped some time in Spirits of Wine, will produce a fine liquid *Blue* Colour, equal to that of *Ultra Marine*. The *Plant* will hardly bear transplanting, without great Care to put it immediately in the Earth; the proper Season for it is *March*, or as soon as the *Haulm* is wither'd. As it is *Carrot-Rooted* it delights in sandy Soil, and should be planted either near a Tree or some Hedge where it may have Support; it will grow about eight Foot high, if it be tied to a Stake.

S E C T.

S E C T. V.

Of the Campanula Pyramidalis, and Canterbury Bells.

OF the *Campanula Pyramidalis* there are two Sorts, one bearing *Blue*, the other *White* Flowers, upon Stalks which are sometimes near six Foot high. Both these kinds have been chiefly cultivated in Pots for the adorning of Chimneys, in the Summer Months, but they will grow very well in the natural Ground, if the Slips about the Roots are parted in *March*. They delight in Sandy Soil, and are very proper Ornaments for the middle Row of Flowers in large Borders; they blossom in *July* and *August*.

The *Canterbury-Bells* have Blossoms of a deeper Blue than those of the *Campanula Pyramidalis*; the Flower-Stems are commonly about three Foot high, so that this *Plant* is proper for the middle of Borders in large Gardens; it is raised from Seeds sown in *March*, but does not blossom till the second Year after sowing; the time of removing the Seedling Plants is either in *August*, or the *March* after they are come up.

S E C T. VI.

Of the PRIMROSE-TREE.

THE *Primrose-Tree*, so call'd by the Gardeners because the Blossoms are somewhat like those of the common *Primrose* in Smell, Shape, and Colour, the Flower-Stems will sometimes rise near three Foot high, and produces Flowers in *June*; the Seed is ripe about *August*, and must be sown in

in the natural Ground in *March*, towards the latter end of the Month. The Seedling *Plants* will not blossom till the second Year, therefore should be sown in a Nursery, and the young *Plants* removed to proper Places the *August* after they are come up. This *Plant* also is proper for the middle of Borders in large Gardens, and will grow in any Soil.

S E C T. VII.

Of the *LILLIES* and *MARTAGONS*.

ALtho' the *Lilly* and *Martagon* are properly bulbous rooted *Plants*, yet for their Extraordinary Stature above all other Bulbs that I know, I shall place 'em among the Giants of this Chapter, and besides, as their Roots flourish the better for remaining constantly in the Ground, I think they may well enough take Place among the *Plants* I am now describing. The *Lillies* are what I shall first examine, of which there are many kinds, viz. the *Common White Lilly*, the *Double Blossom'd White Lilly*, the *Striped Lilly*, the *Orange Lilly*, the *Flemming Lilly*, the *Roman Lilly*, and especially a new sort which Mr. *Fairchild* has lately receiv'd from Abroad, whose Flowers are elegantly striped with Scarlet and White. These *Lillies* are all of them propagated after the same manner, by parting their *Roots* when the *Leaves* are vacant about *July* or in *August*; they all of them blow about the same time, in *May* and *June*, upon Flower-stems of three Foot high, or thereabouts, and equally delight in open *Sandy Soil*; they are very proper *Plants* for the middle of Borders in great Gardens, or to be planted under Hedges in long Walks, except the *striped White Lilly*, which is yet Rarity enough to deserve

deserve a Place in the nicest, and even the smallest Garden: But of these separately.

First, The *White Lillies*, whether with single, or double Flowers, have no other difference than in the make of their Blossoms; that with *single Flowers* is in my Opinion, preferable to the other, which is call'd the *Double Blossom*; the *First* has large perfect *Flowers* in good Quantities; and the other, mis-shapen *Blossoms* without any other Desert than their Novelty. What is call'd the *Striped White Lilly*, differs only from the Common Sort with single Blossoms, in having its *Leaves* curiously edged with a *Cream-colour*: It is so beautiful in the Winter, that few of the gayest *Plants* exceed it.

The *Orange-Lilly*, so call'd from the Colour of its Flowers, is very ornamental in Gardens, and a very proper Companion for the *White Lilly*, and makes an agreeable Mixture with it; and the other, which bears its *Bulbs* on the Flower-stalks, is very desirable for its beautiful red Flowers, as well as for its singular way of producing its Increase. It would be well worth our Enquiry, from whence those *Bulbs* have their rise, whether, they do not proceed from *Female Blossoms* impregnated by the *Farina* of the *Flowers*: I own it is a Case which I have not yet duly consider'd; but I hope I shall be able to give a better Account of it, when I have examin'd it more strictly: And I could wish every curious Reader would communicate his Observations upon Cases of this Kind, directed for me at Mr. *Pemberton's* the Publisher of these Papers; that by a mutual Correspondence of Curious Men, many Mysteries in Planting might perhaps be discover'd and brought to light for the Profit and Pleasure of Mankind, which is the chief End I aim at in these Papers.

The *Martagons*, called by some Gardeners *Turks Turbants*, or *Curl'd Lillies*, differ from the *Lillies* I

have already mentioned in the Frame and Order of their *Flowers*; the *Blossoms* of the *Martagons* hang downward, and have their *Petals* or *Flower-leaves* curl'd or turn'd up, which the *Lillies* have not; but the *Roots*, *Flower-stems*, and *Leaves*, are not unlike those of the *Lilly*; and, in respect to their Culture, are ordered in the same manner, and love a light, sandy Soil. They most of them blow about two Foot high, except the *Virginian Martagon*, which is commonly three Foot in its Flower-stem; their *Flowers* are of several Colours, some *yellow*, others *scarlet*, and are variously spotted; but the *Virginian* Kind far exceeds all others for its beautiful *Flowers*, and is found but in few Places. They are all of them proper for *Parterres*.

S E C T VIII.

Of the FOX-GLOVE.

THE curious Gardeners cultivate three Sorts of *Fox-Gloves*; the first or tallest Sort they call *Iron-colour'd Fox-Glove*; the other two are distinguished likewise by the Colours of their *Flowers*, viz. the *Purple* and the *White*: They are all of them rais'd from *Seed* sown in *March*, but do not blossom till the second Year after sowing; the *Flowers* commonly appear in *May* or *June*. The first blows about four or five Foot high, the other two about three Foot. These *Plants* delight in the Shade, and thrive well in a loamy Soil.

S E C T.

S E C T. IX.

Of Mulleins and Moth-Mulleins.

TH E S E Kinds of *Plants* are very rampant, and therefore very proper Companions for the others of this Chapter; few of them *blossoming* lower than four Foot, but some six Foot high: They are all raised from *Seeds* sown in *Autumn*, or if Convenience will not permit at that time, *March* will serve. They delight in a sandy Soil and shady Places; and altho' they are most of them wild *Plants*, yet the beautiful *Spikes* or *Flowers* which they produce in the Summer, renders them worthy our Regard. There are many Kinds of them bearing *Flowers* of different Colours, some *White*, others *Yellow*, *Red*, *Brown*, *Purple*, *Black* and *Green*: So that I see no reason why they should not be cultivated among other tall *Plants* in large Gardens. They blossom the second Year after Sowing.

S E C T. X.

Of the *ACANTHUS*.

TH I S *Plant* is very rarely found in the Gardens about *London*; and I do not remember to have seen it in above four Gardens in *England*, notwithstanding its Curiosity and easy Culture. The *Flowers* appear in *June* upon Stalks of above two Foot high, they are shaped like the *Blossoms* of the *Fox-Glove*, and are of a *Peach-bloom* Colour: The *Leaves* of the *Plant* are also not without their Beauties; full of Thorns as any *Thistle*, and prettily variegated. The *Seeds* must be sown in *March*,

but will not *blossom* until the second or third Year. They love a sandy Soil and Shade.

S E C T. XI.

Of the *WHITE HELLEBORE*.

TH E R E are two Kinds of the *White Hellebore*, one with *reddish-black Flowers*, and the other with *greenish Flowers*; the first blossoms in *May*, and the other the following Month. The *Leaves, Roots and Stature* of both Kinds are much alike, both having curl'd, plated *Leaves*, and *blossoming* about four Foot high. The *Leaves* are of themselves a pretty Ornament, and the large *Spikes* of their *Flowers* are surprizingly beautiful for their odd Colours; they both die to the *Root* in *Winter*, and are propagated from Off-sets parted in *March*, and planted in a rich, light *Soil*. These *Plants* are proper for large *Gardens*; and with them I shall conclude this Chapter, and proceed to treat of such *Flowers* as are less rampant, and take up less room in *Gardens*.



C H A P. V.

Of the *Middle-fix'd Perennial Flowers*.

IN this Chapter I shall mention such *Perennial Flowers* as are of middle stature, and less rampant than the former, and consequently are proper Inhabitants for smaller *Gardens*. The first I shall treat of is the *Valerian*, and its Kinds.

S E C T.

S E C T. I.

Of the *VALERIAN*.

THERE are three *Plants* known to the Gardeners by the Name of *Valerian*, and distinguished from one another as follows, *Dodineus's* or *Red Valerian*, *Garden* or *White Valerian*, and the *Greek Valerian*; all these blossom about the same time of the Year, in *May* and *June*, and may be raised from *Seed* sown in *March*. The first, *i. e.* the *Red Valerian*, is of less duration than the other two; it blossoms about two Foot high, bearing great quantities of small red Flowers. I have not try'd whether it be increas'd by parting the *Roots*, but have propagated many *Plants* of the other Kinds that way in *March*. The *Garden Valerian* blossoms about the height of the former, bearing Tufts of white Flowers, and has this Quality, which is found in the first, that the *Root*, when it is broken, yields an agreeable Odour. The third Sort, or *Greek Valerian* blossoms about a Foot high, bearing pale blue Flowers in Bunches on the top of its Flower-stems. This is a Fibrous-rooted *Plant*, very easily increased by Slips. I have seen this Sort with variegated *Leaves* common enough in several Gardens.

S E C T. II.

Of the *Perennial CYANUS*, or Blue-Bottle.

THIS *Plant* is either raised from *Seeds*, or propagated from *Slips* taken from the *Root* in *March*. The *Flowers* are valuable chiefly for their

their fair blue Colour, which is the most rare of any other in the Flowers of *Plants*; the Flower-stalks are commonly about two Foot high, blossoming in *May* and *June*, and frequently in *Autumn*. This *Plant* loves a light, natural *Soil*, and an open Exposure.

S E C T. III.

*Of the MONKS-HOOD, or Blue
Helmet-Flower.*

THIS *Flower* is very common in the Gardens remote from *London*, but in those near the City it is rarely found. The *Flowers* are of a deep *Blue*, and of a surprizing Make. They appear upon Stalks of about two Foot high, in *May* and *June*, and are so poisonous, that I have heard, the Eating only six or seven of the *Blossoms* in a Sallet, has kill'd a Gentleman in *France*, who was not apprised of their evil Quality. It is said, that where they grow wild, no Cattle will touch them; and that the Sort of Insect natural to this *Plant*, is an Antidote against the Biting of all venomous Creatures. We may propagate this *Flower* by parting the *Roots* in *March*. It delights in a loamy Soil, and Shade.

S E C T. IV.

Of the ROSE-CAMPION.

THERE are three Sorts of *Rose-Campion* cultivated in our Gardens, the *Red* and *White Flowering-kinds*, and the *Red Double-Blossom*: They all of them blow about a Foot and a half high in *June*

June and *July*. The first two Sorts are raised from *Seeds* sown in *March*, or from *Slips* taken from the *Root* at that time: And the Double-Blossom-kind, which produces no *Seed*, is only propagated by *Slips* in the same Month. This last is a desirable *Plant* for the extraordinary Colour of its Flowers, which is the most dazzling Red I have ever seen. A loamy Soil, and open Exposure, are the most proper for them.

S E C T. V.

Of the Double-Flower'd ROCKET.

THE Gardeners know two Sorts of *Double Rockets*, the *White Flowering-sort*, and that with the *Flesh-colour Flowers*: They both blow in *May* upon Stalks of about a Foot and a half high; the *White Flowering-kind* is more esteemed than the other, and more commonly found in Gardens, These are propagated from *Slips* taken from about the *Root*, and planted in *March* in a loamy Soil; they delight in an open Exposure.

S E C T. VI.

Of the BATCHELORS BUTTONS.

THE Flower called by the Gardeners the *Batchelors Buttons*, is of two Kinds: I mean only such as are cultivated in Gardens; for there are other Sorts of them which grow wild, and bear only ragged single Flowers, and are not thought worthy our Care. These double Flowering-kinds are only different from each other in the Colour of their Flower; the one Red, and the other White:

The First is common enough in most Gardens, but the White is more rarely found. They produce their Blossoms in *June* and *July*, upon Stalks two Foot high. These *Plants* love Shade and a loamy Soil, and are propagated by parting the *Roots* in *March*.

S E C T. VII.

Of the SCARLET LYCHNIS.

THE *Scarlet Lychnis* is a *Plant* so beautiful, that it cannot well be wanting in our Gardens; the single Flowering-sort, as well as the Double-kind, they are both very delightful to the Eye: They bear their *Trusses* of *scarlet Flowers* upon Stalks somewhat more than two Foot high, in *June* and *July*, and are so much esteem'd, especially the Double-sort, that Gardeners usually cultivate them in Pots for the nicest Quarters of their Gardens, or to set in Chimneys in the Summer: This Double-kind is increased by slipping the *Root* in *March*, and that with the single Flower may be propagated after the same manner, or raised in that Month from *Seeds*, which I think blossom the first Year. They love an open Exposure, and a light, natural Soil.

S E C T. VIII.

Of the SWEET WILLIAM.

OF this *Plant* there are two Sorts with single Flowers, and a Double-kind, commonly cultivated in Gardens; the Single-ones differ only in the Colour of their Flowers; the one has *Trusses* of

of Blossoms variegated with Red and White, and the other Clusters of Flowers of a deep Crimson Colour. These two bear their Blossoms in *June* and *July*, upon Stalks of two Foot high; and the *double Flowering* Kind produces its beautiful red Flowers in the same Months upon shorter Stems. The first two Kinds, *viz.* those with the *single* Flowers, may be raised from Seeds sown in *March*, and will blossom the second Year; but the *double* Sort is only propagated from Slips taken near the Root about *March* or *April*, and planted in a loamy Earth, which they delight in. The others may be also increased after the same Manner, or may be laid down in the Earth like *Carnation Layers*.

S E C T. IX.

Of the *CARNATION* or *JULY-FLOWER*, *vulg. GILLY-FLOWER*, and *PINKS*, their several Kinds.

THIS admirable *Flower* is, of all others, the most delightful, as well for the agreeable Scent, as for its beautiful Colours: The Varieties of it are hardly to be number'd, every Year producing new Sorts of it from *Seeds*. The Gardeners divide it into five Classes, which they distinguish by the Names of *Pickatees*, *painted Ladies*, *Bizarrs*, *Flakes* and *Flames*. The Flowers of the *Pickatees* are always of a white Ground, spotted or pounced (as they call it) with *Red* or *Purple*. The *painted Ladies* have their *Petals* tinged on the upper Side, either with *Red* or *Purple*, and the under Side of their Flower-Leaves is plain *White*. The Flowers of the *Bizarrs* are striped or variegated with four distinct Colours. The *Flakes* are of two Colours only, and those always striped; and the *Flames* have a red Ground always striped with Black,

Black, or very dark Colours. Each of these *Tribes* is very numerous; but the *Pickatees* chiefly, of which I have seen above one Hundred different Sorts in one Garden, every one distinguish'd by the *Name* or *Title* of some Person of *Note* or *Quality*. The *Florists* likewise mark the Properties of these Flowers, by the Shape of their *Flower-Pods*; that Race of them which blow without bursting, are called *long-podded* Flowers; and the other, whose *Petals* cannot contain themselves within the Bounds of the *Calyx*, are called *round-podded* Flowers. I have measur'd the *Blossoms* of some of the last Kinds above four Inches over, but have heard of some that were larger. These Flowers are not of any certain Height; some of them Blowing near four Foot, and others not two Foot high; and the Times of their Flowering is also as uncertain as their Stature, some of them beginning their Blossoms in *June*, and others not till near *August*; but this happens from the different Season of Sowing the Seed; those which are put into the Ground about *March*, will blow sooner than those sown in *May*; altho' they do not blossom till the second Year; however, the Height of their *Bloom* is about the Middle of *June*, and it is then the *Florists* have their Grand Assembly, to shew their Varieties, and name their new Curiosities. These Flowers are propagated either from *Seeds* or *Layers*; and as they are so particularly admired by all Lovers of a Garden, I shall be the more exact in the Method of their Culture. First then, to begin with their *Seeds* and Manner of sowing them, my Reader may remember, that in the second Chapter of my First Part, concerning the *Generation of Plants*, I have endeavour'd to explain, how the *Dust* of one Flower will impregnate and enliven the *Seeds* of another; and that from that accidental Coupling, the *Seeds* are so changed, as to produce Plants with

with Blossoms varying from those of the Mother-Plant. I have likewise shewn why double Flowers seldom bear *Seed*, which I conjecture is, because the *Male Parts* in them are either not perfect, or else are confined from Action by the Multiplicity of the *Petals*. This Consideration leads me to advise the curious *Florist* to plant of every good Sort of his double *Carnations* in Beds, on a Line in the Middle; and on each side of them to set at least two Rows of single ones of choice Colours, and among them some Plants of *Sweet-William*, and of the *Cbina* and *Indian Pinks*, which have such Varieties of odd Colours in them as I shall mention hereafter. The *Cbina Pinks* and the *Sweet-Williams*, bearing single Flowers as well as the single *Carnations*, may have Opportunities of communicating their *Farina* into the Cells of the double ones, and set their Seeds, which if they do, we shall not only gather a larger Quantity than we could otherwise expect, but likewise be assured of great Varieties from them. If we have good Fortune enough to find the *Seed Vessels* begin to swell, we must guard them carefully against two Evils, *Earwigs* and *Wet*; the first may be destroy'd by hanging *Hog's Hoofs*, the Bowls of Tobacco-Pipes, or *Lobster's Claws* on the Tops of the Sticks which support the Flowers, and killing the *Vermin*, which will lodge in them, every Morning. And to preserve the swelling *Fruit* from rotting by too much *Wet*, shelter the Flowers with little Basons or Trenchers, which will likewise serve to keep off the too great Heat of the Sun, which would hinder their Growth. With this Care you may expect to find the *Seeds* ready to gather towards the latter End of *September*. This Work must be done when the Weather is dry, if possible, lest after all our Pains they grow mouldy and decay. Gather the Seeds with the Stalks they grow upon, and let them remain in that State exposed

posed to the Sun through a Glas for a Month or two without opening any of the *Husks* or *Seed Vessels* till the Time they are to be sown, which, according to my Opinion, is best done in *April*, in the following Compost.

Take two Load of Sandy Loam (as the Gardeners call it) or of my Medium Soil, to which add one Load of well consumed Melon Earth; sift these well together, and let your Heap lie for a Time to mellow, then sift it a second Time, either to sow the Carnation Seeds in, or to plant your *Layers* or *Roots* of them upon. Having fill'd your Pots with this Earth, and smooth'd it on the Top, sprinkle on your *Seeds*, and covering them half an Inch with the same Compost, press it gently with a Board, and let them stand exposed to the Weather; the Seed will be up in about three Weeks, and the young *Plants* big enough to transplant in Beds the *July* following: They must be set about ten Inches distant one from another, and shaded from the Sun with Mats for about three Weeks, uncovering them every Evening for the Benefit of the refreshing Dews. The second Year after sowing, you may expect many Varieties from the seedling Plants, and 'tis in this the great Pleasure of Gardening consists. Whatever Rarities you find in this Nursery, must be laid down so soon as possible, by cutting half thro' a *Joint*, and splitting the *Internode* upwards, half way to the other *Joint* above it; then must the wounded Part be bury'd in the Earth, and fasten'd down with a Hook of Wood, till it strikes Root, and can shift for itself, which will be in two Months time, if the Earth be light. But as the time of laying down the *Layers* of the Seedlings is uncertain, in that we cannot know which are deserving of that Trouble, therefore I shall take Notice, that the most proper Season for this Work, is in *July*, so soon as the

Layers

Layers are big enough for that Operation, that they may get *Roots* betimes to be taken from their Stocks, and transplanted early in the Autumn, where they are to remain all Winter. Tho' some rather chuse to leave them on the old *Roots* till *March*, before they transplant them; but that I cannot approve of, because I have experienced, that the Removal of these *Flowers* in the Spring often endangers them, and makes them blow late and weak; whereas, on the contrary, if when we take off the *Layers* in Autumn, we then *plant* them either in the *Pots* or *Borders* where they are to blow, we are certain of their Blossoming somewhat earlier, and much stronger; and besides, their *Increase* or *Layers* will be in a fit Condition to lay down betimes. However, whether we *plant* out these *Flowers* in Autumn or in the Spring, it will be necessary to acquaint the Planter, that they should be shaded or defended from the Sun for a Fortnight after Planting; and, during the Winter, should always be nigh some Place of Shelter in case of severe Frosts. It remains now for me to say something of the *Blowing* of a *Flower*, as it is practised by the most ingenious *Florists*: About *April*, when the Flower-Stems begin to put forth, (or *Spindle*, as the Gardeners term it) we must place by each Flower a strait Stick of about four Foot long, and tye the *Spindles* to it as they shoot. So soon as the *Flower-Buds* appear, leave only one of the largest upon each *Flower-Stem* to blossom; about ten Days before the *Flowers* open themselves, the *round-podded* Kinds will begin to crack their Husks on one Side, then must the careful Gardener, with a fine Needle, split or open the Husk on the opposite Side to the natural Fraction, and about three or four Days before the complete Opening of the Flower, must cut off, with a Pair of sharp Scissars, the Points on the Top of the Flower

Flower Pod, and supply the Vacancies or the Openings on each Side of the Husk, with two small Pieces of Velum or Oil-Cloth, which we may easily slip in between the *Flower-Leaves* and the Inside of the Husk, so will the *Blossom* display its Parts equally on all Sides, and be of a regular Figure: But besides this Care, it is a common Practice, and with very good Reason, when the *Blossom* begins to shew its Colours, to shade it from the extreme Heat of the Sun, either with a Trencher-like Board, or some other Device of the like Nature, fasten'd to the Stick that supports it; for *Flowers as well as Fruits, grow larger in the Shade, and ripen and decay soonest in the Sun.* Thus I have done my best Endeavours to inform the curious Gardener of the most proper Method for increasing and improving of this Flower; but am obliged, before I conclude this Section, to mention the several Sorts of *Pinks* proper for Gardens, which are of the same Family with the *Carnation*.

The *Pinks* most commonly cultivated in Gardens, are the *Red Double Pink*, the *White Double Pink*, the *Double Pheasant-Eye-Pink*, the *Dwarf Double Mountain Pink*, and the *Cbina Pink*, besides the common single Ones raised from Seed sown in *Drills* or *Lines* about *March*. The first three of these blow about a Foot and a half high; and although they have been frequently used for Edgings in Gardens, yet I shall take the Freedom to direct them rather for the Inside of Borders, where they should be planted in Spots; they are too apt to grow irregular in Edgings. The *Dwarf Mountain Pink* indeed, as it is a slow Grower, and is seldom above eight Inches high, may well enough be placed on the Outfides of Garden-Beds; but that Sort is now rarely found. These four Kinds of *Pinks* are all raised from *Slips* planted in *August*, or very early in the *Spring*. The *Cbina Pink* is admirable for its strange Variety

Varity of odd Colours, and its surprizing Variegations in the Middle of its *Flowers*; this Sort is yet a Novelty with us, and to be met with only in some curious Gardens: It is raised from Seeds sown in *March*, and (I think) *blossoms* the first Year about a Foot high, and will resist the Frosts of our Climate, if the Flower-Stems are cut down so soon as the *Blossom* is over.

S E C T. X.

Of the *W A L L - F L O W E R*.

I Have seen five Sorts of *Wall-Flowers* cultivated by the Gardeners, which are very well deserving Place among the most delightful Flowers, for their pleasant Odour and lasting Blossoms; the most common Sort of them is that with the *Double Yellow Flower*; and the more rare Kinds are the *Double Yellow Flower*, with variegated *Leaves*; the *Double White*, the *Bloody Wall-Flower*, whose Flowers are Yellow tinged with Red, and a new Sort with *large single Flowers* variegated with *Yellow* and *Brown*; all which blossom about the same Season of the Year, and about two Foot high from the Ground, and may be raised from *Slips* planted in shady Places, either in *March*, *April*, *May*, or *June*: But the last Sort may be more easily propagated from *Seeds* sown in *March*. The *Seed-Vessels* of this and other single Kinds of it, as well as their Flowers, are so like those of the *Stock-July-Flower*, that I am of Opinion they may be made to impregnate each others Seeds, if they were planted nigh enough together; and from such Coupling perhaps might be produced a *Stock-July-Flower* with *Yellow Blossoms*. It is what I design to try myself, as well as many other Couplings of the like Nature;

ture; and altho' the *Seed* of such a Neutral Plant would not be made to grow, the Species may be continued, and increase by planting *Slips* or *Cuttings* of it, as is common in the Culture of *Double Stocks*. These *Wall-Flowers* delight in Sandy Soil, or to grow among Rubbish.

S E C T. XI.

OF STOCK-JULY-FLOWERS, *vulg.*
GILLY-FLOWERS.

THESE are *Shrubs*, like the former, commonly about two Foot high, some Sorts of them blossoming almost all the Year. The single Kinds of them are all raised from *Seeds* sown in *March*, and will come up and be fit to transplant the *Autumn* following, but do rarely blow till the second Year, unless they be raised in *Hot-Beds*, or are of the annual Kind, as they call it. Among the *Seedlings* we often find *Plants* with double Flowers, which should be carefully transplanted into Pots, for the Ornament of the nicest Places in the Garden, or to adorn Chimneys in the Summer. The double Kinds may be increased by *Slips* or *Cuttings* planted in *May*, *June* or *July*; but it is not worth while to propagate the single Ones after any other manner than from their *Seeds*. There are five Sorts of them, besides the *Dwarf* Kind, or *Annual Stocks* for Edgings. The *White Flowering* Kind, that with the *Purple Flower*, the striped Sort, the large *Red Brompton Stock*, and that Sort which blossoms the first Year; of all which the *Brompton* Kind is esteemed to be the best. The Scent of their Flowers is very grateful, and the several Colours of their Blossoms, if they are well mix'd, are extremely beautiful. They love a light natural dry Soil,

Soil, and are apt to perish by too much Wet in the Winter, therefore it is adviseable to sow a young Nursery of them about *August* to blow early the next Year, if the great *Plants* drop off, as they will do in all severe Frosts.

I cannot any where, so properly as in this place, take notice of an Observation which an ingenious Gentleman has communicated to me concerning the *Seeds* of *Plants*, and particularly those of the *Stock-July-Flower*: He says, that he once bought some *Stock-Seed* of a Gardener near *London*, which he sow'd in his Garden in *Oxfordshire*, and brought him great store of double Flowers, and some few single ones of an extraordinary Colour and Bigness; which were so much admir'd by the Gardeners round about him, that he was continually solicited for some of their *Seeds*. He saved a large Quantity, and supply'd several curious Persons with it. What he gave away, maintain'd for the first time of Sowing, its first Excellence; but what he sowed in his own Garden, lost its good Qualities. In short, he was now become a Supplicant to those he had set up, and from the *Seeds* they had saved, he had his first good Fortune in many double Flowers; while those who had saved the *Seeds* complain'd of their ill Luck, and were apt to say, that if they had not gather'd them with their own Hands, they should have believed they had been imposed upon. At last they all agreed mutually to exchange the *Seeds* of this and other Flowers annually, and every one had good Success. This Story, I think, plainly shews how much the Change of Air and Soil contributes to improve some particular *Vegetables*.

S E C T. XII.

Of the French HONEY-SUCKLE.

THIS *Plant* bears Spikes of *purple Flowers*, much like those of the *Lupines* in their Figure and manner of Growth: It blossoms above a Foot high, and makes an agreeable Shew. It is raised from Seeds sown in *March* or *April*, in the natural Ground, which should be light, and lie exposed to the Sun. The Seedling *Plants* will not blossom till the second Year, and sometimes not till the third, especially if the Ground be over-moist. 'Tis a hardy *Plant*, and will live several Years.

S E C T. XIII.

Of the FLOS-CARDINALIS.

I Have seen and cultivated only two Sorts of the *Cardinal-Flower* in *England*; the one blows almost three Foot high, with slender Stalks, and most beautiful Flowers of a Ruby-colour; the other blossoms about two Foot high, and bears pale-blue Flowers: The Seeds of both these Kinds are brought from *Carolina*, and I think from *Virginia* likewise. They must be sown in hot Beds about *March* in sifted light Earth; the Seeds are so small, that they must be but thinly cover'd with Mould, otherwise they will not come up; and the same Rule must be observed in the sowing all manner of Seeds, to cover them with Earth in proportion to their Bigness. These *Plants* begin their Blossom about the latter end of *July*, and continue Flowering above two Months. They

are

are commonly cultivated in Pots, as well to give them some little Shelter in the most severe Frosts, as to place them in proper Places for Ornament in Houses ; but I am satisfy'd they will grow in open Borders, and thrive very well in such Places. In April, they may be increas'd by parting their Roots, and should be planted in Places exposed to the Sun.



C H A P. VI.

Of the Lowest Kinds of Perennial
FLOWERS.

THE Plants which I shall treat of in this Chapter, are such as are of the smallest Kinds, and therefore the most proper for the Outsides of Borders or Garden-beds, and to be cultivated in small Gardens: The first I shall make mention of are the *Primrose*, and *Cowslip*, which are by Gardeners both included in the Name of *Polyanthos*, tho' without Reason ; for the *Primrose* bears only one Flower upon a Stalk, but the *Cowslip* indeed answers to the Name by bearing many Flowers upon a Stem ; but Difficulties of this nature I hope to set to rights some other time in a *Botanical Nomenclator*. In the mean while I shall treat the Gardener in his own Language.

S E C T. I.

Of the *POLYANTHOS*.

THIS Sort of *Plant* is generally divided by the Gardeners into two Classes, viz. the *Primrose* Kind, and the *Cowslips*. These are again distinguished by the Terms of *Single Flowering*, *Double Flowering*, *Hose in Hose*, *Pentaloons* and *Feathers*. The *Single Flowering* Sorts I need not explain, but take notice only that their Colours are chiefly *White*, *Yellow*, *Red*, *Purple*, and sometimes *Violet-colour*, and frequently variegated in their *Flowers*. The *Double Kinds* are not above four in number that I know of, the *Double Primrose*, the *Double-Paper-White-Primrose*, the *Double-Red-Primrose*, and *Double Cowslip*; the Blossoms of which are full of *Petals*.

The *Hose in Hose* Kind has its Blossoms one in another, without Cases. The *Pentaloons* have green Leaves about their Blossoms, which are sometimes variegated with the same Colours of the Flowers they encompass; and the *Feathers*, which seem by nature to be at first design'd for *Hose in Hose*, have their Blossoms so split and curl'd, that they somewhat resemble Bunches of Feathers. Of these there are many Varieties, which are multiply'd every Year by sowing their Seeds. The Curious in this way sow them in *February*, upon a Place prepared with Earth taken out of decay'd Willows, often refreshing the new-sown Spot with Water, and keeping it shaded from the Sun all *April* and *May*, till the young *Plants* are
above

above Ground. The Seedlings so rais'd, will be fit to transplant into Beds the *July*, or *August* after they are sown: The Soil should be somewhat binding, and their Exposure to the Morning Sun; so will they be prepared to blossom the *March* and *April* following. These *Plants* may be likewise propagated by parting their Roots in *August*, which is a much better Season for that Work than the *Spring*, altho' it may be done at that time, even when they are in Flower. I have observed, that such *Polyanthos* as I have cultivated, began to lose the Beauty of their Colours, if I let them stand two Years without parting, and even then would decline; so that I advise every one who covets this *Plant* in Perfection, to sow them every Year, and transplant them frequently. The *Primrose* Kinds of these blossom close to the Ground, and the *Cowslips* about six Inches high; both Sorts may be planted near the Edges of Borders, and near Houses, for the sake of their pretty Smell.

But, to leave the Garden a little, I must recommend to my Reader the Planting some of the common Sorts that grow in the Woods, in some of the most *Rural Places* about his House; for I think nothing can be more delightful than to see great numbers of these Flowers, accompanied with *Violets*, growing under Hedges, Avenues of Trees, and Wilderness-works.

S E C T. II.

Of the *AURICULA*.

THIS Flower, above all others, has been the Pride of the Gardeners, and was so much in esteem some few Years ago, that I have known

one Root of it sold for twenty Guineas ; but that was indeed when they began first to appear in our Climate. The Art of raising them was discovered, and became familiar, and the foolish Vanity of diminishing a Fortune for a Sett of Flowers was then laid aside ; and now, the Collections, which were before without Price, may be purchased upon reasonable Terms. The *Flowers* are indeed very delightful, as well for their surprizing Varieties, as the Fragrancy of their Smell. They blossom in *April*, and are in the height of their Bloom about the Twentieth of that Month : They blow commonly about six Inches high. The numerous Varieties of these Flowers are all distinguish'd by the Names and Titles of Great Men ; and I have often thought of a pleasant Expression of a Friend of mine concerning these Flowers, and their extravagant Prices, *That the Auricula's increased so fast, and the Great and Wise Men decreased so fast, that in a short time this Tribe of Plants would want Men of Note to take their Names from.* But if it is possible for us to admire the Beauties of this *Flower*, when we may raise them with a little Trouble, and a moderate Expence, my Reader may supply himself with them by following the Directions I shall here lay down for their Culture ; and that he may be a right Judge of what are good among them when they come to blow, I shall present him with a Table of their several good Qualities required by the skilful Florists. A good *Auricula* ought to have the following Excellencies: *First*, That the *Flower-stem* be strong and substantial: *Secondly*, The *Foot-stalks* of the *Flowers* must be short, and capable of supporting the *Blossoms* upright: *Thirdly*, That the *Pipe* or *Neck* of each *Flower* be short: *Fourthly*, That the *Flowers* be large, and of a regular Form: *Fifthly*, Their *Colours* should be bright, and well mix'd: *Sixthly*,

That

That the *Eye* be large, round, and of a good *White* :
Seventhly, That the *Flowers* spread themselves flat,
 and be no ways inclinable to *Cup* : And, *Lastly*,
 That there be a good *Truss* of *Flowers* equally
 spread upon the *Stalk*.

With these Perfections we may account an *Auricula* to be good, and from such only we ought to save *Seeds* for sowing, and propagating others, if we hope for Success ; and as a Help to our Design, let us consult the Chapter relating to the Generation of *Plants*, and improve the Variety, by placing such *Flowers* as are of the most different Colours together whilst they are in Blossom ; that so the *Seed-vessels* of the one may receive the *Dust* of the other, and by that means give us an agreeable Mixture of Colours in those *Plants* we raise from Seed ; and it would be well worth our Enquiry, whether the *Seeds* thus impregnated, partake more of the Shape, or of the Colours of the *Flowers* of the Mother *Plant* ; to be certain of which, the *Plant* you make trial of must be castrated of its *Apices*, before they are ripe or burst open.

The *Seeds* of this *Flower* should be gather'd as soon as the *Flower-stem* is yellow, and the *Seed-vessels* come to their full Growth. In the saving and preserving of these *Seeds*, as well as all others, I would advise that the whole *Truss* or *Bunch* of *Seed-vessels* be gather'd with the *Flower-stem*, and remain upon it till the Time of Sowing ; for certainly nothing contributes more to the Strength and Vigour of *Plants* to be raised from *Seeds*, than a right Method of preserving such *Seeds* till the Time of Sowing ; and what can better instruct us in that Method than Nature itself ? Here, I suppose, some People will find fault with my Advice, and be apt to say, that if the *Stems* of *Auricula's*, with their *Seed-vessels*, had remain'd upon the

K 4

Plant,

one Root of it sold for twenty Guineas ; but that was indeed when they began first to appear in our Climate. The Art of raising them was discovered, and became familiar, and the foolish Vanity of diminishing a Fortune for a Sett of Flowers was then laid aside ; and now, the Collections, which were before without Price, may be purchased upon reasonable Terms. The *Flowers* are indeed very delightful, as well for their surprizing Varieties, as the Fragrancy of their Smell. They blossom in *April*, and are in the height of their Bloom about the Twentieth of that Month : They blow commonly about six Inches high. The numerous Varieties of these Flowers are all distinguish'd by the Names and Titles of Great Men ; and I have often thought of a pleasant Expression of a Friend of mine concerning these Flowers, and their extravagant Prices, *That the Auricula's increased so fast, and the Great and Wise Men decreased so fast, that in a short time this Tribe of Plants would want Men of Note to take their Names from.* But if it is possible for us to admire the Beauties of this *Flower*, when we may raise them with a little Trouble, and a moderate Expence, my Reader may supply himself with them by following the Directions I shall here lay down for their Culture ; and that he may be a right Judge of what are good among them when they come to blow, I shall present him with a Table of their several good Qualities required by the skilful Florists. A good *Auricula* ought to have the following Excellencies: *First*, That the *Flower-stem* be strong and substantial: *Secondly*, The *Foot-stalks* of the *Flowers* must be short, and capable of supporting the *Blossoms* upright: *Thirdly*, That the *Pipe* or *Neck* of each *Flower* be short: *Fourthly*, That the *Flowers* be large, and of a regular Form: *Fifthly*, Their *Colours* should be bright, and well mix'd: *Sixthly*,

That

That the *Eye* be large, round, and of a good *White*: *Seventhly*, That the *Flowers* spread themselves flat, and be no ways inclinable to *Cup*: And, *Lastly*, That there be a good *Truss* of *Flowers* equally spread upon the *Stalk*.

With these Perfections we may account an *Auricula* to be good, and from such only we ought to save *Seeds* for sowing, and propagating others, if we hope for Success; and as a Help to our Design, let us consult the Chapter relating to the Generation of *Plants*, and improve the Variety, by placing such *Flowers* as are of the most different Colours together whilst they are in Blossom; that so the *Seed-vessels* of the one may receive the *Dust* of the other, and by that means give us an agreeable Mixture of Colours in those *Plants* we raise from Seed; and it would be well worth our Enquiry, whether the *Seeds* thus impregnated, partake more of the Shape, or of the Colours of the *Flowers* of the Mother *Plant*; to be certain of which, the *Plant* you make trial of must be castrated of its *Apices*, before they are ripe or burst open.

The *Seeds* of this *Flower* should be gather'd as soon as the *Flower-stem* is yellow, and the *Seed-vessels* come to their full Growth. In the saving and preserving of these *Seeds*, as well as all others, I would advise that the whole *Truss* or *Bunch* of *Seed-vessels* be gather'd with the *Flower-stem*, and remain upon it till the Time of Sowing; for certainly nothing contributes more to the Strength and Vigour of *Plants* to be raised from *Seeds*, than a right Method of preserving such *Seeds* till the Time of Sowing; and what can better instruct us in that Method than Nature itself? Here, I suppose, some People will find fault with my Advice, and be apt to say, that if the *Stems* of *Auricula's*, with their *Seed-vessels*, had remain'd upon the

Plant, the Seeds would have fallen to the Ground as soon as they had been ripe; and where is then my Argument, that Nature would keep them cased up all the Winter, as I propose to do from her Example?

To these I answer, that the Seeds of *Vegetables* are like the Eggs of *Fowls*, which, after they are perfected in the *Matrices* of either, will only keep good a certain time before they ought to be set, or put into a proper Posture for Hatching; the Seeds which fall to the Ground are nourished by the Earth they fall upon, till the proper Ferment begins for their *Vegetation*. And if they are kept in their Cells till a proper Season for Sowing, it is very reasonable to believe they will find here a natural Nourishment, since it is known that they were perfected from the same *Juices* in the same *Cells*, and that were they to lie dry in a Chamber for six Months, without either Earth or their own natural Nourishment to feed from, they must certainly lose their Strength, altho' perhaps they may not entirely decay. But, to proceed: The Seeds of the *Auricula* should be gather'd in a dry Morning, as I have directed, and laid upon Sheets of Paper in such Places where three Hours Sun may pass over them every Day for near a Month, till they are out of danger of growing mouldy, then may they be laid by in a dry Place till the First of *February*; at which time the Seeds may be cleans'd out, and sown in the following manner:

Prepare a Box of *Oak* or *Deal* four Foot long, two Foot wide, and six Inches deep, with Holes in the bottom six Inches distant from one another. In this Box lay two Inches thick of *Cinders* of *Sea-coal*, and over them spread some fine, sandy Loam the Depth of three Inches, over which sift some Earth taken out of hollow *Willow-trees*, till the Box is full; and then sow the Seeds on the top without any Covering of Earth, only pressing them into the

Mould

Mould with a Piece of flat Board, to settle them below the Edges of the Box, that in watering, the light Seeds may not float over the Brims; this Seminary must be continually refreshed with Water, so that it never be dry, for without a constant Moisture the Seeds will never come up. It is necessary to cover the whole with a Net, to prevent the Birds from destroying the Seed; and likewise to acquaint the Gardener, that from the time of Sowing to the beginning of *April* the Box should be so placed to receive the Heat of the Sun, but after that time should be removed into some shady Place, lest the young Seedling Plants be scorch'd and wither'd away. But if it should so happen, thro' the Neglect of watering, that the Seeds do not come up the first Year, let the Case be preserved till the Year following, and there will certainly be a good Crop, as I have often experienced.

The Seedlings will be strong enough to transplant the *July* or *August* after they appear above Ground; they should then be planted about four Inches distant from one another, in Beds of light Earth well sifted, where, if possible, they may only enjoy the Morning Sun, and it will be necessary to shade them even from that Warmth for a Fortnight after Planting. The *April* afterwards you may expect some of them will begin to shew themselves, and then as they answer the good Qualities I have mention'd, transplant them into Pots fill'd with any one of the following Soils.

First, To half a Load of Sea Sand, add one Load of Loamy Soil, and one Load of Melon Earth; let all these be well mix'd and sifted together.

Second Earth, Take one Load of Sandy Loam, to which add the like Quantity of Melon Earth; mix and sift them together.

Third

Third Earth, Take of rotted Wood, or the Bottom of a Wood Pile, one Load, to which add the same Quantity of Loam, and half a Load of Melon Earth prepared as the other Earths.

I have already hinted in the first Part, but I shall once more take Notice, that all mix'd Soils or Compost should lie some time, for the several Parts to incorporate with one another before they are used. The three Sorts I have here set down have been made use of by several Gardeners with Success. I shall not pretend to say which is the best; for I have seen *Auriculas* blow well in each of them, therefore shall leave my Reader to please himself. I think there remains little more for me to say concerning this *Flower*, than to take Notice of the Method commonly used in the blowing them, which is thus. Set your Pots upon Shelves, one above another, in such a Part of the Garden where the Morning Sun may only come at them, and as these *Flowers* are commonly cover'd with a sort of *Dust* which contributes in great Measure to make them beautiful, some Covering must be provided for their Shelter against Rains, which are apt to wash it away, and destroy their Colours. The Seasons for parting their *Roots* are either when they are in *Flower* or about St. James's Tide, but the latter is judg'd to be the best. And now I shall conclude this Section of the *Auriculas* with a Word or two of Advice to the curious Florist, that he observes to keep them from much Wet in the Winter, often taking away their rotted *Leaves*, and that he does not let the first Week in *January* pass (if the Weather will permit) without taking the decay'd Earth from about the *Roots* of his *Flowers*, and filling up the Pots with fresh, from his Heap of prepared Soil. By which Means his *Plants* will be strong against their Flowering Season.

S E C T. III.

Of the *BLACK HELLEBORE*,
or Christmas-Flower.

OF these *Plants* there are reckon'd three Sorts among the Gardeners, which are all *Dwarfs*, and very proper for small Gardens, seldom blossoming above half a Foot from the Ground; the most forward Blower of them is the *Black Hellebore* with the *White Flower*, which begins to blossom about *Christmas*, and continues till *February*; the second Sort is that with a *Green Flower* blossoming about the same time; and the third Sort has a small cut Leaf almost like *Fennel*, and bears a *Yellow Flower* in *May*; all these are propagated by parting the Roots in *September*, and delight in a sandy Soil and Shade. I have indeed taken off their off-sets, and planted them when they were in Flower; but *Autumn* is much better. As yet I have not seen any ripe Seeds of these *Plants*; but I suppose it was for want of examining them at due Season; if they bear any, as I am pretty well assured they do, the proper Season of sowing them is as soon as they are ripe. Every one of these Sorts are so rare, that they are hardly to be met with, unless at Mr. *Fairchild's* at *Hoxton*.

S E C T. IV.

Of the *GENTIANELLA*.

THIS *Plant* is one of the lowest Race; I have seen but one Sort cultivated in our *English* Gardens, altho' there are many Varieties of it frequently

quently found in the *Dutch* Collections, and those of Neighbouring Countries; the *Flowers* of that Kind which are known to us, almost touch the Ground, but are, notwithstanding their Humility, as great an Ornament to a Garden as any Flower I ever saw; the *Blossoms* open in *April*, and also frequently appear in *November* and *December*, if the Weather be open; their admirable *Blue* Colour is hardly to be imitated by *Ultra-Marine* itself. This *Plant* delights in a sandy Soil, where it will put forth many *Slips*, which may be either parted from the Root in *March* or *August*.

S E C T. V.

Of the *HEPATICA*.

THE *Hepatica* is of several Kinds, viz. that with the single *White Flower*, the single and double *Peach* colour'd Flowers, and the single and double *Blue* flowering Kinds; those with the single Flowers begin their Blossom in *January*, if the Weather be open, and the double Flowering Sorts blow a Month later; they are increased by parting their Roots either in *April* or *September*, and will only thrive in a light sandy Soil.

S E C T. VI.

Of the *VIOLET*.

THERE are several Sorts of *Violets* commonly cultivated in Gardens, the most common of them are the single *Blue* and *White* Kinds, the more rare are the double *Blue*, the double *White*, and that Sort with *Variegated Leaves*; all these Kinds
blow

blow in *March*, and besides their Beauty, perfume the Air with a most delightful Odour. The Sorts with double *Flowers* blossom also in *Autumn*, if their Roots are strong. These *Plants* may be increas'd by transplanting their *Runners*, which will of themselves take Root at every Joint without any Art.

The proper Season for this Work is either in *February* or *September*, but the last is the best. These should be planted among *Primroses* and *Cowslips* under Hedges, and the most rural Places of the Garden, or near the Edges of Garden-Beds; they delight in a binding Soil and shady Places.

S E C T. VII.

Of the D A I S I E S.

THE *Daisy* is one of the smallest *Plants* that grows, its *Flowers* blowing above three Inches from the Ground. The Sorts commonly known and cultivated in Gardens, are the *Double-Red*, the *Double White*, the *Double Red and White*, the *Coxcomb*, or *Rainbow Daisy*, and the *Hen and Chicken Daisy*; the last of these has little *Stalks* of *Flowers* growing out of the main Blossoms; besides these, I have seen near fifty different Sorts which were rais'd from Seed in one Year by Mr. *Fairchild* at *Hoxton*, which I suppose were produced by the Coupling of the *Mother-Plants* one with another; for which Reason I would advise every curious Gardener to sow the Seeds of his best *Daisies*, that have stood near enough to couple, about *August*, or early in the Spring, that he may furnish himself with Varieties. These *Plants* are increas'd by parting their Roots either in the Spring or Autumn Seasons, and love a binding Soil. They make pretty Edgings for *Flower-Beds*.

S E C T.

S E C T. VIII.

Of the *THRIFT*, or *SEA-GILLY*.
FLOWER.

I Have had three Sorts of *Thrift*, the *Common*, the *Scarlet Flowering* Sort, and that with the *White Flower*. These are only proper for Edgings of large Borders in long Walks, or the most rude Parts of Gardens; they blossom in *May* and continue a long time in *Flower*. We may propagate them from *Slips* in *August* or *March*, they love a strong Soil. *N. B.* The *Sea Pinks* make good Edgings for long Walks, and may be propagated after the same manner as the former.

I have now given my Reader an Account of all the *Perennial Plants*, which I think are worthy of our Care in Gardens, and shall next proceed to give proper Directions for the Culture of the next Degree of *Hortulan Plants* with *Bulbous Roots*.



C H A P. VII.

Of *Bulbous*, or *Onion rooted Plants*.

ALTHO' a *Bulb* is properly such a Root as is round and succulent, made of many *Tunics* wrapt over each other, like the Root of an *Onion*; yet according to the Gardeners I shall comprehend under the Title of *Bulbous Rooted Plants*, the *Anemones* and *Ranunculas*, tho' their Roots differ from the Shape I have describ'd a *Bulb* to be of. I design in this Chapter to speak first of those
Bulbs,

Bulbs, or *dry Roots* (as they are called by some) which are commonly taken out of the Ground every Year, as soon as their *Stalks* are decay'd.

S E C T. I.

Of the *TULIP*.

THE *Tulip* wants nothing (in my Opinion) but a grateful Scent to make it the finest Flower in the World; there are infinite Varieties of it vastly different from each other, which display their Beauties, and eclipse the Glories of all other Plants of the Garden. These Ornaments of Nature are as kind as they are beautiful, some or other of them blossoming from *January* to the latter End of *May*. They are divided into two *Classes*, viz. the *Præcoce Tulips*, or early Blowers, and the *Serotine*, or later Blowers; and these may be distinguish'd by their *double* and *single Flowers*. Again, with respect to their Colours and Stature, they have other Denominations, as *Bagetts*, which are the tallest Blowers, commonly *Purples* and *White marbled*; Secondly, *Agates*, which blow shorter than the former, whose *Flowers* are vein'd with two Colours; and Thirdly, *Bizars*, which have four Colours, tending to *Yellows* and *Reds* of several Sorts. The Varieties of these Kinds are severally distinguish'd by the Names of Cities, or such like Characters. The good Qualities of *Tulips*, which the Gardeners generally approve of, are the Beauties of their Colours, the Strength and Height of their *Flower-stems*, and that their Flowers be of the Shape of an Egg, without sharp Points on the Top of their *Petals*, but above all, their Novelty.

I have often wonder'd at the extravagant Price which has been, and even at this Day is, given for these

these Flowers in *Holland* and *Flanders*, when every Year produces so many new Varieties; there are indeed the best in those Countries that I have ever seen; but I believe if we in *England* took the right way for their Management, we might soon boast of our good Success, and propagate great Numbers of them at a very cheap Rate. For this End, I shall set down some Trials I have already made, and offer some reasonable Conjectures which may yet farther contribute to their Improvement.

The Method of raising them from Seeds, is what I shall first offer to my Reader. The *Flower Stems* being left remaining upon the Roots, will perfect their Seeds about *July*, which will be fit to gather when the *Seed-Vessels* begin to crack or burst open. They should then be cut close to the Ground in a dry Day, and laid in some dry Place till *September*, which is the most proper Season for sowing them, and the following Spring they will come up, if they are kept under Shelter. The first Year their *Roots* will be no bigger than *Wheat Corns*, but after their second Appearance above Ground they may be taken from the *Pot* or *Case* they were sown in, and sow'd or sprinkled over a Bed of natural sandy Soil well sifted, where the Thickness of half an Inch of the same Earth should be spread over them; thus may they remain without any Culture; then adding half an Inch of Earth for Covering every Year till they begin to blow, which will be in five or six Years after sowing: But let no Man be discouraged at the Length of the time they lie in the Ground without Blowing, the *Plant* will answer his Expectation; let him sow every Year, and he will gain new Varieties successively, when his first Seminary begins to blow. I have known many fine *Tulips* raised by this Means, but have once heard of a large Bed of *Seedlings*, which were only of plain Colours with-

without Variegations; but that might happen from the Qualities of those Flowers which the Seeds were saved from. But, however, if by chance our young Nursery should prove all of them plain Flowers, we are not yet without hopes, the Plainness of their Colours I suppose to proceed from a Strength of Nature, as we are sure the Variegations of all Flowers are the Effects of Weakness, and want of Nourishment: For whoever has cultivated those Sorts of *Tulips* which are call'd *Breeders*, must know they are of plain Colours, and are always large, tall-blowing *Flowers*; 'tis from those *Breeders* are commonly produced the *Flowers* of the greatest Value for their Stripes sake; now and then one of them breaking (as they term it) into beautiful Mixtures of Colour or Variegations. This Alteration of *Tulips* is reckon'd by the Gardeners to be the Effect of Chance; but I believe, the two following Observations will explain the Mystery. Near *Brussels* a Man is famous for a little Spot of Ground, in which, by some strange Virtue (as is reported) these *Breeding Tulips* change themselves into fine, variegated *Flowers*; in-somuch that their *Roots* are brought thither from several Parts, to be educated and brought up for the nicest Collections, and Money given for their standing. In that Place it is rare if three in five do not break into Stripes the first Year after they are planted: But this Alteration I think may be accounted for, by examining the Soil; which is nothing but common Rubbish sifted, or at most, there is not one twentieth Part of it natural Soil.

It is very plain that a Soil of this nature must impoverish the *Roots* that are set in it, and consequently the *Flowers* must some way or other shew the Distemper of the *Roots* from whence they spring. And to continue the Variegations of *Tulips*, they are taken out of the Ground every Year

as soon as they have done blowing; for if they were always to remain in the Earth, they would in time become plain *Flowers*. But, *Secondly*, the other Observation I have made concerning the Striping of these *Flowers*, was in a Gentleman's Garden near *London*, who planted a Bed of *Breeding Tulips*, and the following Year, when they came to blow, he found a fine striped *Tulip* at each Corner of the Bed, and none of the others were any ways alter'd: This I suppose happen'd from four large *Pyramid Yews*, which then grew at several Corners of the Bed, and had exhausted the natural Strength of the Soil about them. I shall therefore recommend these Observations to the serious Consideration of every ingenious *Florist*. And now, supposing that by these, or any other Means, a Gentleman is stock'd with a good Collection of Rarities of this Sort, I shall proceed to acquaint him of the proper Method of planting and cultivating them; and, first, of the Soil.

In *Holland*, where I have seen the finest Collections of this Sort of *Flower*, the Soil is naturally sandy; as near as I can judge, about two Parts in three of Sea-sand to one of common black Earth: In this Soil only, I have seen of the *Baggett* Kind of *Tulips* blossom above three Foot high, and the other Sorts in proportion. The Curious in that Country always observe two Things in planting their *Tulips*: The *First* is, to plant all the forward Blowers in a Bed together; and when they plant the late Flowering-kinds, they place the tallest Sorts in the middle Line of the Bed, and on each side of them set two Rows of the shortest Blowers. The Season for putting in these Roots is always the last Week in *August*, if the Weather be fair. They give them little shelter till the Flower-Buds appear; and then they defend them from Blights with Mats, or painted Cloth, strain'd upon Hoops; which Covering

vering serves also for sheltering the *Flowers* when they are blown, from Rain and the scorching Heat of the Sun, either of which would quickly spoil the Blossoms. These Roots are always taken out of the Ground as soon as their *Flower-stems* begin to decay, and being well dry'd, are laid up in Paper till the Planting Season returns.

N. B. The best *Baggett Breeders* are call'd *Bagget-Primo's*, and are sold in *Holland* now for five Pounds per Hundred. These *Flowers* are increased from Off-sets, which grow about the Roots; and of other *Breeders*, the best Sorts are the *Van-Porters*, the *Beau-Regard*, and a *Violet-Breeder*, which I have seen break into extraordinary Colours, at Mr. *Whitmill's* at *Hoxton*.

S E C T. II.

Of the *RANUNCULUS*.

THE *Ranunculus*, next to the *Tulip*, is desirable for its beautiful *Flowers*; there are many Varieties of it brought from *Turky* every Year, so that the Names of every Sort now known in *England*, would rather be troublesome than instructive to my Reader. The best way will be for him to take a view of the several curious Collections of them in the Gardens about *London*, when they are in flower: However, that he may be the better apprised of what I design to treat of in this Section, I shall describe some few Sorts of them. The *Ranunculus* bears its Blossom in *April* and *May*, upon Stalks about six or eight Inches high: The Double-flowering Kinds are crouded with *Petals*, after the manner of the *Province-Rose-Flowers*, and some of them as large. The Colours of those *Ranunculus's* I have seen, are deep *Scarlets* vein'd with

Green and Gold Colours, Yellow tipp'd with Red, White spotted with Red, Orange Colour, plain White, Yellow with Black, and one Sort of a Peach-Bloom Colour; which yet I have only seen at Mr. Blind's at Barns in Surrey. The Single-kinds blow somewhat taller than the others, and are commonly variegated with pleasant Colours. All these are increased by Off-sets found about the Roots when they are taken up, and may likewise be propagated from Seeds saved from the Single-kinds; but as they will not ripen in England, we have hitherto been beholden to the French for them. The proper Seasons for sowing the Seeds of this Plant, is the latter end of August, and the Soil which they most delight in, is rotted Leaves, or such Soil as may be taken from the Surface of the Earth, in Woods or Groves of long standing.

Tanner's Bark, or the Bottom of a Wood-pile, are likewise very proper Earths for these Flowers, if they are well sifted and mix'd with one third Part of natural Soil. These Plants are somewhat tender, and require some Shelter in the Winter, especially if they have began to spring before the Frosts. The Seedling Plants come up the Spring after they are sown, and blossom the second Year; when they are out of Flower, and the Stalks and Leaves are decay'd, their Roots should be taken out of the Ground, and being well dry'd in the Sun, must be preserved in dry Sand till the latter end of September, which is the best Time for re-planting them, if the Ground be not over wet.

S E C T. III.

Of ANEMONIES.

OF this Kind of *Plant* there are many Varieties, as well with *single* as with *double Flowers*. Their Colours are chiefly *Reds*, *Blues*, and *Purples*; their Blossoms, which are seldom above five or six Inches from the Ground, open themselves about *April*; and if the Roots are suffered to remain in the Earth, they will again repeat their *Flowers* in *September*, and continue blowing the greatest Part of the Winter: But it is seldom that the Gardeners will leave any of their choice *Anemony* Roots in the Earth after the Spring-blossom is over, lest they decay by too much Wet, which is frequent enough in our Climate, in the Summer Season. The Roots of these *Plants* should be taken out of the Ground and preserved, and replanted like those of the *Ranunculus*, with this Difference only, that *Anemony* Roots should be increased by breaking the *Knots* asunder, which are about the bigness of a small Button, and planting them after they have laid two or three Days in the Sun. These *Flowers* love a sandy Soil without Mixture; chiefly such as is found about *Battersea* in *Surrey*, where they blow very large. The Seeds of the Single-kinds ripen about the latter end of *May*, and should be carefully gather'd as soon as they begin to crack, or shew their Down, otherwise the least Wind will carry them away. From them we may raise innumerable Varieties, if they are sown in *February*, and lightly cover'd with Earth. They blow the second Year after sowing.

S E C T. IV.

*Of the JONQUIL, NARCISSUS
POLYANTHUS, and others of the
same Tribe.*

THE *Jonquil* is a Flower generally admired for its delightful Scent; the Double-kind blossoms in *April*, and that with the single Flower somewhat sooner: The *Roots*, which are *bulbous*, like those of the *Tulip*, love a light, sandy Soil, and an open Exposure: They should be taken out of the Ground, and re-planted like other *Bulbs*: And in like manner should be order'd the *Narcissus Polyanthus*, whose sweet-scented Flowers are not less desirable than *Jonquils*. These, with all other Kinds of the *Narcissus*, are propagated from *Off-sets* of their *Roots*. Next to those I have mention'd in this Section, the *Double-white*, and *Double-yellow Narcissus* are worthy our Esteem; and even the Common *Daffodil* is to be admir'd for its pretty Ornament in rural Parts of the Garden. All these blossom in the Spring about a Foot high.

S E C T. V.

Of the HYACINTH.

THERE are many Kinds of *Hyacinth*; some with single *Blue Flowers*, and others with single *White Flowers*, and with double Flowers of both those Colours: The *Grape Hyacinth* and *Starry Hyacinth* have also their Varieties; all which, as well as the *Hyacinth of Peru*, will bear the Severity of our Frosts: All of them, except the last, blow
early

early in the Spring, and are most of them well scented. They are increased from *Off-sets* of the *Roots* planted in *September*, in Beds of sandy Soil: The *Flowering-stems* of these *Plants*, except the *Hyacinth* of *Peru*, are seldom more than half a Foot high from the Ground.

S E C T. VI,

Of the *CYCLAMEN*, or *SOW-BREAD*.

I HAVE seen near thirty Sorts of this *Flower* in the *Amsterdam Gardens*; but in *England*, we have not above four Sorts, viz. the *Spring*, *Autumn*, and *Winter-blowing* Kinds, with *Pink-colour'd Flowers*, and the sweet-scented *White-flowering* Kind. The last is somewhat tender, and rarely found in our *Gardens*; but the other Sorts, which are hardy enough to stand abroad all the Year, are pretty common. These are rather *Turnip-rooted Plants* than *Bulbs*, and are only propagated from *Seeds* sown as soon as they are ripe, which indeed are more like *Roots* than *Seeds*. These *Plants* are beautiful, as well in the *Variegation* of their *Leaves*, as the delightful Colour of their *Flowers*: They love a light Soil, and can only be transplanted with safety about *Midsummer*, when their *Leaves* are decay'd; their *Blossoms* seldom rise above four Inches from the Ground.

S E C T. VII.

Of the GUERNSEY-LILLY.

THE *Guernsey-Lilly* has hardly its Equal for Beauty among the Flowering Race, and yet it is rarely found in our Gardens; which may be perhaps for want of a right Knowledge of its Culture. Mr. *Whitmill* of *Hoxton* has this *Plant* flowering with him every *Autumn*, even from *Off-sets* taken from great *Roots*. The Blossoms are large, and not unlike those of the *Lilly* in their Make, seemingly powder'd with Gold Dust upon *Rose-colour'd Petals*. The most proper Soil for this *Plant* is two third Parts of Sea-sand to one of natural Soil, or a light, sandy Earth mixed with an equal Quantity of Rubbish. It will bear the Hardships of our Winters, if it be planted in either of the foregoing Soils under a warm Wall; but chiefly if it be kept dry. The *Flower-stems* of this *Plant* are commonly about a Foot high. The *Off-sets* will blow in about three or four Years after they are taken from the old *Roots*.

S E C T VIII.

Of the GLADIOLUS, FRITILLARIES, and IRIS.

THE *Gladiolus*, or *Corn-Flag*, blossoms in *May*, upon *Stalks* of almost two Foot high; the Flowers are of a *Rose-colour*, and last about six Weeks. The *Fritillaries* are of several Kinds, blossoming in *April*; their Flowers are chequer'd with two or three Colours, sometimes *White* and
Red,

Red, others are *Green* and *Brown*, or *Yellow* and *Black*: They are curious Plants, and are very proper (like other *Bulbs*) for *Parterres*. The *Iris* is likewise a numerous Tribe, some Sorts of them blossoming in *April*, others in *May* and *June*: Their *Flowers* are of several Colours, and their Figures different; they are all of them pretty Ornaments for Gardens, and may be increas'd by *Off-Sets* taken from their Roots when their *Stalks* are decay'd. These, like other *Bulbs*, love a light Soil.

S E C T. IX.

Of the *COLCHICUM*, and *CROCUS*.

THE *Colchicum* has a Root somewhat like the Bulb of a *Tulip*; but its Flower resembles that of a *Crocus*. There are many Kinds of *Colchicums*; those with single *White* and *Pink-colour'd* Flowers, some with double *Pink-colour'd* Blossoms, and another Kind with Flowers chequer'd with *Pink-Colour* and *White*: All these blossom in *August* and *September* about four Inches above Ground; they delight in sandy Soil, and will only bear transplanting about *Midsummer*, when the Roots are entirely at rest. The *Saffron Crocus* blows at the same time with the *Colchicums*, bearing *Purple* Flowers of the same Height and Bigness: This Plant is of great Use (as well as Beauty) for the sake of its *Pistillum*, which is the *Saffron* used in *Medicine*. I have often wonder'd that this Plant is not more commonly cultivated in our Gardens, seeing how valuable a Commodity it produces, besides the Pleasure of its Blossoms, at a Season when very few Flowers appear. This is one of
the

the last kind Offices of the departing Summer, and should be taken Notice of. The *Leaves* appear as soon as the *Flower* is past, and remain all Winter, which in the Spring should be ty'd together in *Knots* to help the Increase of the *Roots*, which will be fit to remove or transplant about *Midsummer*. This *Plant* chiefly delights in chalky Ground, but will prosper also in a sandy Soil. The way of preparing the *Saffron* for Use should have been inserted in this Place; but at present I have only an imperfect Account of it; and therefore shall defer it, till some curious Person in that Art has been pleased to communicate to me a more exact Receipt for its Management than what I have now by me, which I shall gratefully acknowledge. The several Kinds of *Crocus*, which blossom in the *Spring*, are the common *Yellow* and *Black-striped*, the *Yellow Dutch*, the *early* and *later Purples*, and the *White Sort*: All these blossom about *February* and *March*, and make the best Flowering Edgings of the Spring; the *Roots* may be taken out of the Ground in *June*, and replanted with other *Bulbs*: They are increased by *Off-Sets*, and love a light Soil. The *Crocus* may be likewise raised from *Seed*, as the curious Mr. *Whitmill* has experienced, who has raised great Varieties by that means.

S E C T. X.

Of the *SNOW-DROP*, *WINTER-ACONITE*, *DENS-CANINUS* and *ORCHIS*, or *SATYRION*.

THE *Snow-Drop*, altho' it is a common Flower, should not be wanting in *Parterres*: It is so fit a Companion for the *Crocus*, as well in respect to its Height, as time of Flowering, that it has been customary to plant them together. The double Sort is very agreeable, as I have observ'd it at Mr. *Whitmill's*. Their Culture likewise is the same, so that one Trouble of the Gardener will serve for the Propagation of both; as likewise of the *Winter Aconite*, which is also one of the first Leaders of the Spring, beginning to display its pretty *Yellow Blossoms* about the first Week in *January*. The *Roots* of this sort of *Aconite* are not so regular in their Shape as the *Bulbs* of the *Crocus*, nor so misshapen as the *Roots* of *Anemonies*; they are so small, 'tis hard to find them when the Leaf is decay'd. This kind of *Aconite* will soon overrun the Ground where 'tis planted, as well by shedding its Seeds, as from *Off-Sets*, which its *Roots* freely put forth. The Flowers of it are never more than three or four Inches above the Ground. The *Dens-Caninus*, or *Dog's-tooth'd Violet*, is another Dwarf like the former; it produces its Blossoms in *March*, of a *White Colour*, somewhat tinged with *Purple*, like the Blossoms of the *Spanish Jessamine*. This Plant must be propagated like the others I have mention'd in this Section, and, like them, loves a sandy Soil. The *Orchis* has many Varieties, which may be found in every Herbal. I shall mention only three or four Sorts, which are

are commonly cultivated by the Curious, such as the *Bee-Flower*, the *Fly-Flower*, the *Lizzard-Flower*, and a more common Sort found in Meadows, with *Purple Flowers*: These should all be removed with Balls of Earth about their Roots, just when their Flower-Stems begin to appear above the Ground; they blossom about half a Foot high in May.

I shall now conclude this Chapter of *Bulbous-rooted Plants*, with acquainting my Reader, as a certain Rule which he ought to observe, that *Bulbs* are taken out of the Ground every Year only for the Preservation of the Variegation of their Blossoms; but such as are not admired on Account of their Stripes, should be left standing in the Earth at least three Years, for the Benefit of their Increase; and also that the most safe time of removing *Bulbous Roots*, is when the *Leaves* are decay'd.



CHAP. VII.

Of ANNUAL-FLOWERS, and PLANTS, their Culture and Manage- ment in Gardens.

THE *Plants* which I shall treat of in this Chapter, are of that Nature, that the Method of Culture proper for one or two of them will be sufficient to inform my Reader of the right way of managing all those which may be comprehended under the Denominations of *Annuals*. In short,

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the curious Planter has no more to do, than provide a Hot-Bed about *February* or *March* for the Seeds of the most tender Kinds of *Annuals*, and to prepare the Soil of his natural Garden-Beds for interring the Seeds of the most hardy Sorts about the middle of *March*; and that he may with more Ease be inform'd of the several Kinds which are now commonly used for the beautifying of Gardens, I shall give him an Account, in two separate Sections or Tables, of their Names, Stature, particular Beauties and Times of Flowering.

S E C T. I.

Of the *ANNUALS* to be rais'd in a Hot-Bed.

I. **T**HE *African Marygold* has a large double Yellow Flower, blowing above two Foot high, in *May*, *June*, *July*, *August*, and *September*.

II. The *French Marygold* has a smaller Flower than the former, Yellow intermix'd with Red, near two Foot high, blossoming from *May* to *September*.

III. *Sweet Sultan*, three Sorts, with White, Yellow, and Purple Flowers; they smell like Musk, and blossom two Foot high from *June* to *September*.

IV. *Capficum Indicum*, or *Guinea Pepper*, with long and round Scarlet Fruit, for which it is only admired, begins to make a handsome Show in Gardens about *July*, and lasts till *September*. This Plant is about a Foot and a half high. The common

man People in *Italy* pulverise the *Yellow Seeds* contain'd within the *Pods* of this *Plant*, and use it instead of *Pepper*; and *Dr. Compton*, late Bishop of *London*, frequently eat of it in the same way.

V. *Marvel of Peru*, two Sorts; one with *Red* and *Yellow Flowers*, the other *Purple* and *White*: These blow from *July* to *September*, two Foot high.

VI. *Amaranthus*, two Sorts; the *Tricolor* and *Cock's-Comb*; the first is only beautiful in its *Leaves*, which are variegated with *Scarlet*, *Yellow*, and *Green*; the second is admired for its *Scarlet Flowers*, like *Cock's-Combs*. These are Ornamental *Plants* from *July* to *September*, growing about two Foot high.

VII. *Convokvulus*, three Kinds; the *Major*, with a *Purple Flower*; the *Minor*, a *Blue Flower*, variegated with *Yellow* and *White*; and the *Scarlet Flowering Kind*: These blow from *June* to *August*, and creep upon the Ground.

VIII. *Female Balsomes*, three Sorts; the *Rose Colour*, the *Purple*, and the *White Kinds*: These blossom about a Foot and a half high, from *June* till *September*.

IX. *Belvidere*, or *Pyramid-Bush*, a pretty *Green*, without *Flowers*, about two Foot high.

X. *Bush Basil*, a small *Shrub*, about a Foot high, with sweet-scented *Leaves*. His Royal Highness the Grand Duke of *Tuscany* presented me one Year with above fifty different Sorts of *Basils*.

XI. *Nastur-*

XI. *Nasturtium Indicum*, or *Indian Cresses*, two Sorts, one large, the other small, has Flowers variegated with *Yellow* and *Scarlet*; they run upon the Ground, and blow from *May* till *September*.

XII. The *Sensitive Plants*, two Sorts, one of which is called the *Humble Plant*, because the *Leaves* of it fall down to the Ground upon the Approach of a Man's Hand, and the *Sensitive Plant* curls up its *Leaves* by touching it: These two must be constantly kept under Glasses all the Summer.

I must beg the Reader's Pardon if I introduce the *Tuberoſe* among the *Annuals* of the *Hot-Bed*, which every one knows to be a lasting *Bulboſe Root* in *Italy*; but as it is *Annual* with us, I hope to be excused: The *Roots* of it must be planted in the *Hot-Bed* with the other *Plants* of this Section, and must be kept from Water till the *Leaves* begin to put forth. In *July* and *August*, their *Flowers* appear upon *Stems* of three Foot high, which afford a most agreeable Scent.

For the more particular Management of the *Plants* I have here mentioned, my Reader must take Notice, that when the *Seeds* are come up, the young *Plants* should be transplanted at four Inches Distance from each other, and should not quit the *Hot-Bed* till the second Week in *May*: They will then bear the Air of our Climate, if they have by Degrees been used to it.

S E C T II.

Of the *ANNUAL PLANTS* to be sown
in the Natural Ground.

THE Seeds of those Flowers I shall treat of in this Section must be sown in the Natural Earth in *March*, on the very Places where they are to blow, whether for Standard *Plants*, or in Spots, or for Edgings.

I. The *Annual Sun-flower* blossoms from *June* till *August*, with large *Yellow Blossoms* upon *Stems* of six Foot high.

II. The *Lark's-Heel* should be sown in Spots; it blows with several Colours upon *Stems* of three Foot high, from *June* till *August* or *September*.

III *Flos-Adonis*, sown in Spots, blows a Foot high in *June* and *July*, with small *Crimson Flowers*.

IV. *Nigilla Romana*, blossoms in the same Month with the former; it bears a *Blue Flower* about a Foot and a half high.

V. *Garden Poppies* should be sown in Spots; their Colours are various, and their Flowers very beautiful, but not lasting; they appear in *May* and *June* upon *Stalks* about two Foot from the Ground.

VI. The *Dutch Wild Poppy*. This does not blow so high as the former; its Flowers are *Red* and

and *White* striped, blossoming from *June* till *August*.

VII. *Cyanus*, or *Annual Bottles*, are of several Colours, blossoming in *June* and *July* upon *Stalks* of about a *Foot* and half high.

VIII. *Lupines*, three Sorts; the great *Blue*, small *Blue*, and *Yellow* Flowering Kind: All these blossom in *May* and *June*; the first about two *Foot* high, and the others little more than half that Height; the *Yellow* has a pleasant *Scent*.

IX. *Scarlet-Beans* are twining *Plants*, bearing *Knots* of *scarlet Flowers* from *May* till *September*.

X. *Everlasting Flowers*, sown in *Spots*, blossom about a *Foot* and half high in *June*, *July*, and *August*: Their *Flowers* will remain fresh for many *Years* after they are gather'd, and are dy'd of several Colours by curious *Persons* for *Flower-pots* in the *Winter*.

XI. *Wing'd Peas*, sown in *Drills* for *Edgings*, have pretty *crimson Blossoms*, blowing about six *Inches* high in *May* and *June*.

XII. *Annual Stocks*, for *Edgings*, or sown in *Spots*, blossom in *May* and *June*, bearing their *Flowers* of a *Pink Colour*, about six *Inches* high.

XIII. *Venus's-Looking-glass*, is proper for *Edgings*, or to be sown in *Spots*: It blossoms the same Height, and at the same Time with the former, bearing *Flowers* of a *Violet Colour*.

XIV. *Venus's-Navel-wort* has white Flowers, is a pretty Dwarf Plant, fit for Edgings, or Spots; and blossoms also with the foregoing Plant.

XV. *Candy Tufts* are of two Sorts; one with white, the other with red Flowers: They are both proper for Spots, or Edgings, and flower with the former.

XVI. *Heart's-Ease*, or *Viola Tricola*, has its Flower variegated with Purple, Yellow, and Red: It is a Dwarf, like the last, and makes pretty Edgings. This also blossoms in May and June.

I have now no more to do than to remark, that all the *Annuals* I have mentioned in this Section will blow sooner or later as their Seeds are put into the Ground; and I would advise the Curious to sow some of their Seeds in every one of the Summer Months, if he would have them succeed one another in flowering; but the Dwarf Kinds especially.

I shall here give him a Design of a Garden Bed divided into five Parts: The * middle Line A is proper for the tallest Plants mentioned in this Treatise, the Lines BB for the middle Plants, and those marked CC for the Lowest; in all which Divisions of the Bed he should contrive to allot one third Part for *Perennial Plants*, one third for *Bulbous-rooted Plants*, and the like Proportion for *Annuals*; considering at the same time what Months in the Year each Plant will blossom in, and assort them in such manner that all do

* Fig. II. of the Third Plate.

not flower together or at one time, but that an agreeable Mixture of Flowers may continually be found in the Garden, succeeding one another as long as the Season will permit; and this he may easily perform by the Assistance of these Papers.

DIRECTIONS to Gardeners, who have not had the opportunity of travelling, with regard to some Particulars in laying out of Gardens, and some technical Words frequently mentioned in this Treatise.

A *Pyramid Plant* is represented thus in a Draught; and when we have occasion to place several of them upon a Ground Plat, they must be all set upright with that which we first design; so likewise the Shades must be all placed the same way.



A *Headed Plant* is represented thus:



A *Pyramid Plant*, cut and divided, may be represented thus:



A *Collonade*, or *Arcade* in a Garden, is generally planted with *Tew-trees*, and may be express'd thus: The Bases and Capitals may be carv'd and gilt, or else made of *Wood*, painted with *Verdegrease Green*, to be taken off and put on when the *Trees* want

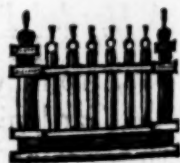


Clipping; for if these Ornaments are cut in the *Yew*, they will never be kept regular, and yet be very expensive.

Haba, or *Fossee*, are Terms of the same signification, tho' the first is a new coin'd *Word*: They mean a *Ditch*, or *Moat* to enclose a *Garden*, whether the *Ditch* has *Water* in it or not; but the *Haba*, by the Custom of five or six Years, intimates a dry *Ditch*, so regulated by Slopes, and so deep that it is unpassable. It makes a fine open *Fence* to a *Ground*. Sometimes when it cannot be made deep enough to be a *Fence* of itself, it is fortified with a *Pallisade* running thro' the middle of it. It may be express'd in a *Plan* thus:— It appears very beautiful when the Slopes are well made, and cover'd with fine *Grass-turf*.



Pallisades may be express'd thus:— The Meaning of the *Word* is open *Pales* or *Rails*.



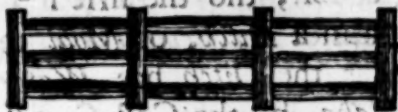
Treliage-work is an open *Work* of *Wood*, as the former; it is call'd also *Trellis-work*, and sometimes *Espalier*, but with this difference only, that this is compos'd of *Rails* crossing one another so as to be seen through, and the foregoing consists of open *Rails* or *Pales* set upright; this sort of *Work* however is commonly call'd *Treliage*, when it is made into *Portico's*, *Arbours*, *Pavilions*, and such-



like,

like, it is in that case commonly done with *Laths* crossing one another, and turn'd into diverting *Figures* as the Builder sees occasion.

After this, one may explain that an *Espalier* for *Fruit-trees* should be built after this manner, viz.



Or else of this kind:—



VERNAL means the *Spring*; so that if one wanted a *Spring Crocus*, one might ask for it properly, by calling it a *Vernal Crocus*: And if it is a *Summer Flower*, all *Flowers* of that Season are *Æstival*; so the *Flowers* of the *Autumn* are call'd *Autummal*; and those *Flowers* or *Fruits* which appear in *Winter* are call'd *Hybernal*.

Laune is properly an open *Passage* between any *Fences*, from whence comes the word *Lane*; but in the *Gardening Language* means any open *View* from a *Point of Sight*, where it is bounded by *Woods*, *Walls*, or such-like: And yet how far are many from the *Design*, when, in their *Draughts* and *Designs* of *Gardens*, they lay down a large *Grass-plat* for a *Laune*?

The *Vivacious Plant* is one that dies to the *Root* when it has flower'd, and ripen'd its *Seed*, rising fresh from the *Root* again the next Season: Such are *Tulips*, *Hyacinths*, *Asters*, *Campanula's*, and such-like. *Vivacious* is a *Word* which is used in *Gardening* on this account, though taken from the *French Word Vivace*, which signifies *Brisk*.

Sempervive is a Term used for such Plants as are ever-living. The *Aloe Hepatica*, or that commonly call'd the *Barbadoes Aloe*, is call'd *Sempervive* by the *Sailors*, because it will live several Years without Earth, even though it is hung up in a Room. And of the *Sempervives* is also the *House-leek*.

Convolvulent, or *Convolvent*, is a Term used in Gardening for such Plants as twist and twine about any thing they can lay hold on. Such Plants as twist in this manner take their Character from the *Convolvulus* or *Bind-weed*.

Perdifol, a Plant, when it is asked for by that Name, is such as drops its Leaves in the Winter; so an *Ash* is a *Perdifol*, because it loses its Leaves in Winter.

Opuntia signifies an *Indian Fig*, and the *Indian Fig* is also call'd a *Prickly Pear*, by those who have been abroad; and also the same Name is given it by the Inhabitants of *America*.

Whirle, or *Clasper*, is such as grows upon *Vines*, with which they catch hold of any thing they can lay hold of. The manner of their taking hold of Trees, or such-like, is by twisting about them in a screw-like manner.

Fibre or *Fiber* of a Root, is a String of a Root, so all Plants that have stringy Roots are called fibrous-rooted Plants. The *Polygonus* and the *Auricula* have such Roots. *Capillary* Roots are those Roots which are as fine as Hairs,

Bulbous

Bulbous Roots are such as are composed of many Cases or Coats, which enclose or cover one another; such as the *Onion*, the *Tulip*, and such-like.

Tuberous Roots are such as are form'd of *Tubers* or *Knobs*, like the *Anemomy Root*, and such-like. The *Truffle* is also a *Tuber*. And the *Potato Root* is a *tuberous Root*.

Herbaceous Plants are such as bring their Leaves but a little height above Ground, and are properly *Herbs*; such as the *Violet*, the *Primrose*, the *Nettle*, the *Dock*, *Grass*, and such-like.

Gramineous Plants are Plants that grow like Grasses, as Corn of every sort, such as *Wheat*, *Barley*, *Oats*, and *Rye*, are *Gramineous*; for *Gramen*, in *Latin*, signifies Grass, and *Gramineous* is taken from that Word.

Germination is a Term frequently used in Gardening, and signifies the Sprouting or Budding of a Plant.

Terebration is a Term used by the ancient Writers, signifying Boring: It was a Method used in the First Times, for grafting of Trees; which was done by boring into the Wood of the Tree, and fixing a Cion in the Place.

Pavilion, in the Gardening Phrase, signifies a *Summer-house*, tho' it rather means a *Tent*.

Fett of Water, is a Spout of Water, such as is play'd in Fountains, or rising in a Stream.

Gerbe of Water, is a large Column of Water rising in a Stream. The best of this sort, with the least

Expende of Water, is in the Gardens at *Carshalton*, belonging to *Thomas Scawen Esq;* who was the Contriver of it. It seems to be a full Column of Water, of ten or twelve Inches diameter; but it consists of many Spouts placed on the Verge of a Circle of that Diameter, and makes a very elegant Appearance.

Cascade means a Fall of Water. The common Method of Cascades in Gardens, is to let the Water fall over Steps, in a gentle Declension; as in that near the *Bath*, and more particularly the King of *France's* Palace at *Marli*; as likewise at his Grace the Duke of *Devonshire's* at *Chatsworth* in *Derbyshire*.

Cataract of Water, is a large Fall of Water from some Eminence; as if a River was to fall at once, twenty, thirty, or forty Feet, or more, as we have natural Instances in many Places.

Sheet of Water, is a Spread-fall of Water, which, by passing over a Level, represents somewhat like a Sheet, or Table-cloth. They are very beautiful in Gardens.

Grotto, or *Grotty*, is properly a natural Cave; but as they are now made in Gardens, they are generally built with Stone, or Brick, with an arched Roof, and lined with Shells and shining Stones, intermix'd with artificial Coral and Corallines, with some Spouts of Water to be play'd at pleasure: The Grotto is also cover'd with Earth, and turf'd, or else planted on the top with Flowering Shrubs, disposed in the wildest manner they possibly can be; for the outside Appearance ought to look rural. The finest of the kind that I have observed in

in Europe, is that belonging to Thomas Scawen Esq; at Carshalton in Surrey.

There are two ways of making artificial Coral for this Use; for the true Coral would be much too dear: Provide first some dry Branches of Trees that grow the most like the manner of Coral, or else with *Wyers*, make the Figure of a Branch of Coral; and then melt some *Bees-wax* and *Turpentine* together, and mix with it enough *Vermilion* to give it the Colour of Coral, and dip your prepared Branches in it; then let them cool and harden, and dip them a second or third time, till they are fully perfect.

Or else melt *Brimstone*, and mix *Vermilion* with it, and dip your Branches in that, managing of it as prescribed above; this, if the Branches are not dry, will have Blisters on them like rough Coral.

Of the Colours necessary for illuminating of Draughts and Designs for Gardens, with the Method of making them transparent.

GARDENERS, when they draw Draughts, or make Plans for Gardens, on new Grounds, are generally obliged to buy Colours ready prepared in Shells; and tho' they are well mix'd, yet they give a Heaviness to the Design. The transparent Colours are therefore the best, because they carry off a Design for a Garden with a light Air. For this reason I have considered that transparent Colours will be of use to those who make Plans or Draughts for Gardens, because whatever is colour'd with them may be made as light and easy as one pleases; but in the handling of them I must give this Caution: If any of the Colours I shall here recommend, should appear too thin or light at their first laying on,

on, it must be imagin'd, that when the whole Draught is colour'd, it will look much darker, and become more heavy; so one can't lay them on too thin at first.

Greens are of the greatest Use; and I shall begin with them.

To make a bluish Green we are to dissolve *Verdegreafe*, and render it so liquid, that when we pass it over a Draught, the Drawing may be seen through it.

To prepare this Colour, take a quarter of a Pound of common *Verdegreafe*, for the distill'd Sort will not do; break the *Verdegreafe* a little, if it be soft, but if it happens to be of the harder Sort, beat it in a Mortar till it is as small as Dust or Scowring-sand; put this in a Pipkin, and add to it a Pint of White-wine *Vinegar*; set this upon a gentle Fire and let it boil, then add a little white *Argol* in Powder, and keep it stirring till the *Verdegreafe* is dissolv'd: In the mean while touch the Stick you stir the Liquor with, upon Paper, till you find it of the Colour you desire, and then, whether the whole Body of the *Verdegreafe* is dissolv'd or not, pour it off clear, and let it stand till 'tis cool before you put it into a Bottle, it will after a Day or two clarify itself; and then decant it and set it by for Use.

The remaining Part of the undissolved *Verdegreafe* may have more *Vinegar* put to it, and setting it over the Fire as before, you may have a second Quantity of Liquor.

This will make a delightful Colour to be used in the first Colouring of Slopes to shew the light Parts of them, and then take the following Colour to mix with it, in order to strike such Shades as may be thought proper.

The transparent Yellow to mix with the aforesaid Green, in order for shading a Draught, and

to make a Grass Green, or to be used by itself as Yellow.

In the preparing of this yellow, we must provide about an Ounce of *French Berries*, which may be had at any *Colour-Shop*; and then take a Pint of River-water, or Rain-water, and set it over the Fire, with as much *Pearl Ash* in it as amounts to a Drachm, and let it boil five or six Minutes to make a strong *Lixivium*; then add the *French Berries*, and let them boil, keeping them stirring, till by touching a Paper with some of the Liquor, you find it of the Colour you desire; and then pass the Liquor through a Sieve, and as soon as it is cool, put it in a Bottle and stop it close.

One may boil these *Berries*, till the Liquor will almost become red; but one may always know what Height it is brought to, by touching it upon Paper as above directed: A nice *Colourist* would chuse two or three Sorts, to shade one another.

When we have these two Colours, by mixing them together, they will make as faint, or as strong a Shade to the first Colour as you desire; and by putting more of the Yellow than the first Green, mixing them well together, will make a fine Grass Green: But a little Practice will bring any one to order it in any Colour he pleases. This will serve to colour Grass-plats; but in the colouring of pyramid or headed Plants, lay on the *Verdegrease* Colour first, and shade with this; and then, for Gravel, mix a little Carmine with the Yellow, till you find it of such a Height as may be necessary.

When you would represent Water, either in a Basen or Canal, you may thin the first Green with common Water, to colour those Places with only a small Taint.

Subjects of this nature cannot be more easily explain'd than in the Method I have followed: And in the next Part, I propose to treat of the Improvement

Improvement of *Fruit-Trees*, *Kitchen-Gardens*, and *Green-House Plants*; all which I shall advance something new upon; and must repeat the same Desire I have before done to the *Curious*, to communicate the Observations that fall in their way upon the particular Parts of *Planting* and *Gardening*.

The End of the Second Part.



NEW

NEW
IMPROVEMENTS
OF
Planting and Gardening,
BOTH

Philosophical *and* Practical:

CONTAINING

The best Method of Improving *Fruit-Trees, Kitchen-Gardens, and Green-House-Plants.*

Illustrated with COPPER-PLATES.

PART III.

By RICHARD BRADLEY, F. R. S.

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IMPROVEMENTS

J. A. M. E. S. S.

PLANTING AND GARDENING

FOR THE



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INSTRUMENTS OF MEASUREMENT

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To the RIGHT HONOURABLE

JAMES,
Earl of CAERNARVON,
Viscount *WILTON*,
AND
Baron of *Chandos*, &c.

My LORD,



THE best Reason I can give, that these Papers claim Your Lordship's Protection, is, That they endeavour to advance in a small Instance the Good of our Country, and the Benefit of Mankind. You are so kind an Encourager of every thing which looks that way, that I promise myself, even this mean Attempt will not fail of some Countenance from your Lordship, which is the surest Means of its being acceptable to the rest of the World. They who shall happen to profit by this Work, will owe the greatest Debt to your Lordship, since Your Name will be the best Recommendation

The Dedication.

dation of its Worth. But that my Imperfections may not entirely take shelter under so great Authority, I do assure Your Lordship, that I have omitted no Pains to make it as complete as I could; and what it still wants of being so, may well be imputed to my Distance from your Lordship's improving Thoughts, by the short Experience I have had of them, in relation to this Subject; I am sure that my Observations have lost much for want of so just Corrections.

My LORD,

IT would be as improper in me, as disagreeable to you, to talk of the great Merit and Esteem You stand in with all Mankind. The Publick feels the Benefit of all Your Actions, and will do You Justice without my reminding them. My Hopes of not offending Your Lordship arise wholly from the Usefulness of the Subject of this Work; and I humbly beg it may be accepted as an Instance, that I can distinguish a little, as well as the rest of the World, in my professing myself,

My LORD,

Your Lordship's most Dutiful,

And Obedient Humble Servant,

R. BRADLEY.



NEW
IMPROVEMENTS
OF
Planting and Gardening,
BOTH
Philosophical *and* Practical.
Of FRUIT-TREES.

CHAP. I.

Of the *VINE, FIG, LAZEROLE,*
and MULBERRY.



THE Fruit I shall treat of, is known
all over the civilized Part of the
World ; and its Qualities more ge-
nerally admired than any other Fruit
growing upon the Face of the Earth.
And yet, notwithstanding the vast
Tracts of Ground in *Europe* and elsewhere, which
PART III. N are

are found planted at this day with *Vines*, there is hardly any *Plant* so unskilfully ordered in our *English* Gardens, or so little understood by our Gardeners.

S E C T. I.

Of the *VINE*.

THE End of Planting *Vines*, is certainly to have good store of *Grapes*; but the Way to attain a large quantity of good *Grapes*, does not only depend upon the Choiceness of the Sorts we plant, the Nature of the Soil they require, and the proper Situation for them; but, above all, the Times and Methods of Pruning are absolutely necessary to be understood.

The Kinds which I find to ripen best in *England*, are the *July Grapes*, the *Black-Currant Grape*, the *Early Sweet water Grape* lately brought from the *Canaries*, the *Arbois*, or *French Sweet-water Grape*, the *Burgundy*, and *Morigon*; which are all ripe with us by the middle of *August*, if rightly managed, and the Season be kind: And after them, the *Muscadines*, *Parsley Grapes*, *Fronteniacs*, and *Claret Grapes*. I have seen all these in great Perfection with us, but I know not of any other Kinds early enough to ripen well in our Climate.

'Tis then of these Kinds I would chiefly advise to be propagated; which may be done, either by laying down the young Branches as soon as the Fruit is gather'd, or by making Plantations of Cuttings at that time, always minding to let a Bud or two of the Layer or Cutting be under Ground; for it is from those Buds only the Roots put forth. I have also frequently made Layers in *March* and *April*,

April, which have been fit to transplant the *Michaelmas* following; and I have known it practised to draw a young Branch thro' the Hole at the bottom of a Garden-pot, about *Christmas*, and then filling the Pot with Earth, it has took root, and been cut from the Mother-plant the *Michaelmas* following with the Fruit upon it. The *Vines* thus raised in Pots, will hold their Fruit good almost till *Christmas*, if they are shelter'd from the Weather in a Green-house, or some such-like Place; and it is easy to conceive how pleasant it will be to have them thus brought growing to the Table in a Desert.

By what I have observed in planting of *Vines*, the Month of *February* is the best, if the Weather be open; and great Care must be taken in the Removal of this Plant, that the Roots be not too dry before it be re-planted; for that would greatly endanger it: Therefore wet Moss wrapped about the Roots, if they are to be sent to any remote Place, has been practised with good Success.

Concerning the Soil proper for *Vines*, I shall give the first Hint from that ingenious and candid Piece of Mr. *Lawrence's*; where, with so much good Reason, he tells us, that he cannot easily be brought to think that any Soil or Situation can be too dry for the Roots of the *Vine*, after having seen at *Barnwall* near *Oundle* in *Northamptonshire*, a flourishing *Vine* grow from between the Joints of an old Castle Wall near twenty Foot high from the Ground, which he was told produced admirable *Grapes* when it was well managed. This Observation of that curious Gentleman might be sufficient of itself to inform us of the Property of the Soil required for *Vines*, without seeking after other Experiments to satisfy us in it.

In the Gardens (late of my worthy Friend Mr. Balle) at *Cambden-House*, there are now growing several *Vines* in the Walls; some of which were planted there by that Gentleman's Direction, and one in particular, which is a *Muscadine*, produces every Year fairer Bunches of Grapes, much sweeter, and earlier ripe (at least a Fortnight) than any other *Vines* in the Garden; altho' there is the best Collection of forward Grapes I have yet met with in *England*.

But, yet farther: If we take a view of the *Vineyards* abroad, which afford the richest and best Wines, we find the Soil either rocky, or gravelly. The *Cbianti* Wine of *Italy*, for example, grows upon a high Ground, in a rocky Soil, like to that which they make Lime of; and the strong *Spanish* Wines are the Growth of the Mountains, which will hardly produce any other kind of Plant, they are so extremely dry: In a word, all the Places which I have seen or heard of, which produce good Grapes, have a dry, hot Soil, and are somewhat mountainous.

From such Observations, and some Experience I have had in the Culture of the *Vine*, I find chalky Hills, such as are frequent enough in *Oxfordshire*, are very proper to plant *Vines* upon, if they lie well exposed to the Sun; so hot, gravelly Ground, which lies dry and warm, will produce better Grapes than any of the rich Soils prepared with Horse-dung; but in a Garden where either of these Soils are wanting, the Rubbish of some old Building will very well supply the Defect, if it be well mix'd (about one third Part) with the Earth about the Roots of the *Vines*.

I think I need not say how much the Ripening of some Sorts of Grapes depends upon a good Wall and warm Exposure, and that even with those

Helps

Helps we sometimes fail of ripe Grapes; it may not be amiss then, to consider of some Ways that may expedite the Budding out of the *Vines*; and consequently by making them blossom earlier than usual, may hasten the Growth and Ripening of the Fruit while we enjoy the Summer Sun.

As the proper Soil and right Exposure for *Vines* contributes to the early ripening of Grapes, so the right Season for general Pruning likewise is helpful to the speedy Perfecting of the Fruit, as I shall shew afterwards; but shall first take notice of an Observation or two of *Vines*, that were made to shoot near two Months sooner than Nature would of herself have given them Motion: In *Kensington* I have observed a *Vine* that happen'd to be planted against a Baker's Oven, to sprout in the Beginning of *March*, and continue from that time to shoot vigorously all Summer; and although it had very little Advantage of the Sun's Heat, and grew in a stiff, wet Ground, the Grapes ripen'd much sooner than any others of the same Kind. But at the *Pot-House* at *Fulham*, where the Soil is sandy, and the Exposure warm, there was a *Vine* planted against an Oven which was constantly kept hot for baking of Earthen Pots, that began to bud about *January*, and would, as I am inform'd, have ripe Grapes in *June* by the help of a Glass Frame which was used to cover it in severe Weather: And so to plant a *Vine* against the Back of a Chimney, where a Wood or Turf Fire is constantly kept, so as to warm the Bricks, it will by that means sprout early, and have its Fruit sooner perfected than other *Vines* which have not that Help; as I have experienced,

Supposing then that a *Vine* by this means is brought to shoot or blossom earlier than usual; let us not deceive ourselves with the too common

Opinion, that the exposing the Blossom or young Fruit immediately to the Sun, will be a Means of hastening its Maturity, or making it large; and, as some do, to pull away the Leaves from about it; for that rather retards the Ripening, than forwards it, by contracting so much the outside Skin of the Fruit, that it cannot receive the Nourishment it ought, and would otherwise admit of; and I am sure, whoever knows any thing of the Growth of *Vegetables*, will allow, that the Shade always contributes to the large Growth of Plants and Fruits, and that the Heat of the Sun is chiefly requisite for the ripening of Fruits; therefore let the young growing Fruit always remain shelter'd with its Leaves till it be full grown, and then begin to lay it open to the Sun for ripening.

I shall next consider the *Pruning of Vines*, especially of those growing against Walls; for it is a right Knowledge of the Seasons, and Manner of Pruning, which chiefly contributes to give us a plentiful Store of good ripe Fruit.

It is commonly practised by the Gardeners to prune their *Vines* in *December*, which Season they hold to be much better than the Months of *January* and *February*; for the *Vines* pruned in those Months are apt to bleed away too much of their Strength; and it is as common among them to leave four Buds or Eyes upon every pruned Branch, whether they are strong, or weak Shoots. I have, I must confess, seen *Vines* that have been so order'd, produce good Fruit; but am assured, whoever was to see the *Vines* which are now in Mr. *Whitmill's* Garden at *Hoxton*, would go another way to work. It is his Method to prune his *Vines* so soon as the Fruit is gather'd, and according to the Strength or Thickness of the Branch he leaves growing, he allows a due Length, a very strong
one

one about a Yard long, and those of less vigour are pruned shorter in proportion. By this Method of Pruning, I observe he never fails of large quantities of Grapes, ripening very well, and much earlier, than any of the same Kind pruned after the usual manner.

The *May* after this Pruning, our *Vines* must be again look'd over, and then disburden'd of the small weak Shoots, rather by breaking them off, than cutting; and such Shoots as have then Fruit appearing upon them, must be topp'd, so as to leave a sufficient number of Buds above the Fruit, upon each Branch, in proportion to its Strength or Thickness, observing always not to prune nearer to the Fruit than three or four Buds.

In *June* the *Vines* must be examin'd for the third time; and the barren Branches, which will then be shot to a great Length, should be pruned to such Lengths as answer to their Vigour, or else taken quite away, if they are not wanted to furnish some Vacancy on the Wall, or to be laid up for Fruit-bearing the next Year.

About the beginning of *August*, the Grapes of the forward Kinds will be full grown; and then we may again give a fourth Pruning, in order to expose the Fruit to the Sun for ripening; but yet, let it not be left too naked of Leaves, lest it be injur'd from the cold Dews, which begin to fall the latter end of the Month.

In the Summer Prunings of *Vines*, due Regard ought to be had to the Number of Branches which the Wall will require to be laid in the Winter to supply the Place of old Wood, which should then be taken away; for it is a certain Rule, that no Branches of the *Vine* bear Fruit, but such as are the Produce of the last Year; and those, if they are

discreetly managed, seldom or never fail to furnish Fruit in abundance.

Thus I have set down what I know concerning the Management of *Vines* against Walls, and shall now proceed to offer some few Hints concerning the Way of ordering them in *Vineyards* for the making of Wine, which I am satisfy'd may turn to as good account in *England*, as they are known to do in many Parts of *Germany*.

If a *Vine* will prosper upon a Chalk, as we are certain it will, how trifling would be the Expence to plant an Acre of such Ground with *Vines* in some well-exposed Place, on the Declivity of a Hill? The yearly Income of such Land can hardly be a Shilling, if it be strictly Chalk; and the *Vines* may be raised as I have directed, with very little Trouble; and then for the Charge of Planting, a Week's Work for a Man would more than do it, seeing there is no necessity of manuring the Ground. The whole Expence before they began to bear Fruit, which would be the third or fourth Year after Planting, could hardly amount to twenty Shillings; so that I see no room for any Objection upon that account. The chief thing will be, to shew upon reasonable Grounds, that Plantations of this kind will produce ripe Fruit; and that I think may be made appear very plainly.

In the first place, plant only the forward Kinds of Grapes, which have often enough been experienced to ripen in open Borders, without the help of a Wall; witness the *Vines* at a *French* Gardener's at the Back of *Swallow-street*, *London*; those at the Honourable ——— *Johnson's*, Esq; at *Twittenham*; the *Vineyard* near *Bath*; that near *Greenwich*, and almost in every Nursery.

Secondly,

Secondly, The Chalk-Hill, which I propose to be planted with *Vines*, will certainly reflect as much Heat upon the Fruit, as any Wall whatever; and every one knows that the Cold in those Parts of *Germany* where the *Rhenish* Wines are made, is much more Powerful than what we feel in *England*; so that since we need not be apprehensive of too much Cold in the Winter, and may reasonably expect as much, if not more Warmth in the Summer, our *Vineyards* may certainly afford as good Wine as what we receive from the *Rhine*, and some Places in *France*, and consequently turn to the Owner's Account.

But that we may answer every Objection that may be made against Planting of *Vineyards* in *England*, give me Leave to recite what I have heard relating to the making of Liquors with unripe and sour Fruits. In *Devonshire* a Gentleman made a Vessel of *Verjuice* of *Crab* or *Wilding-Apples*; which being plac'd in his Cellar among other Liquors, was not used till about three or four Years afterwards, and was then found to be so palatable and exceeding pleasant, that he now prefers the Liquor made of such wilding sour Fruit (after it has had time to digest) to any *Cyder* of that Country. So I have known *Verjuice* made of half-ripe Grapes, that after two or three Years keeping in a Vessel, has become delicate Wine; and the *Rhenish* Wines, when they are newly made, are so sour, that they are not fit to drink; but after several Years standing, afford us that incomparable Liquor which is called *Old Hock*; and on the contrary, sweeter Liquors are apt to turn sour by keeping; which is one Argument to prove, that a continued Motion and Alteration of the State of every created Atom, is requisite to support the Frame of Nature;

ture; and, as I conceive, was it possible that any one, the least Particle of Matter, could be destroy'd or lye still, all Life and Being must cease; such Dependency has the greatest Bodies upon the smallest Beings, or the most inveterate Opposites upon one another. The skilful Chymist knows how to separate the differing Parts subsisting in Liquors from one another; the volatile Spirits from the more watry Parts, and those from the more oily; so that we find every Liquor contains a Chain of certain Qualities; and Liquors are only differing, in that one has perhaps the *Acid* more prevailing, the other the *Alkali*, or either of those Powers more or less predominant at certain Seasons. The Sweet, when it prevails in any Liquor, is not without the Sour subsisting in it, altho' it has not Power to appear till its Opposite begins to decline; and so the Sour is not without the Rudiment of Sweet, although it cannot be discern'd till the Time of Ripeness approacheth. But I shall forbear advancing any farther at this time in so vast a Field, and proceed to the Business in hand: That our Chalk Hills, and those that are accounted the most barren Mountains in *England*, are very proper to plant *Vines* upon, and the higher the better; for 'tis observable, that several *Vineyards* in one Country, planted with the same sort of *Vines*, produce very different Wines; those on the Tops of Hills much stronger and better than those which lie lower; insomuch that one Barrel of the Mountain Wine will sell for much more than that growing in the Valley; and so far as I can learn, the strongest Wines are always the Produce of the highest Mountains,

To plant a *Vineyard*, let the Place where each *Vine* is to stand be open'd and prepared before any of the Plants are taken out of the Nursery; let them stand four or five Foot asunder in Lines, and the most proper Season for their planting is in the first open Weather in *February*. It is usual to prune these *Vines*, according to their Strength, the *September* before transplanting, leaving not more than four Buds on the strongest, and then they will require no other Care the first Summer but to keep them clear from Weeds; about the End of *September*, after planting, shorten the Shoots of that Summer according to their Strength, and the Summer following the strongest of them will begin to shew a little Fruit; this second Year the breaking of the small Shoots and superfluous Branches should be carefully done in *May* and *June*, and two or three Shoots only maintain'd on each *Vine*, according to its Strength, and those not to be shorten'd till the *September* following; these should be supported by Stakes or Poles, so that they may not run close to the Ground, but about a Foot above it, lest too much Wet spoil and rot the Fruit; for the nearer the Ground the Grapes grow, if they do not touch it, the riper and sweeter they will be, and the stronger the Wine. In a word, continue from time to time this Method to preserve young strong Shoots every Year to bear the following Summer in proportion to the Strength of every *Vine*, cutting away all the old ones, which (were they to remain) would only rob the Plants of their Strength.

But if notwithstanding all the Care of pruning and weeding the *Vineyard*, the *Vines* are not inclined to produce large Bunches of Fruit, lay Oxe's Blood or Carrion to their Roots about *November*, or, as it is very common in all the *Vineyards*

yards Abroad, manure them with human Dung that has lain some time to meliorate, and lost its Odour. This way of enriching Ground has very evidently the best Effect upon Fruit-Trees of any other Manure whatever, but *Vines* chiefly, which will not bear any other.

With this Management I doubt not that our *Vineyard* will produce good Store of Grapes in five or six Years after Planting; and if the Owner should then be disposed to try what Wine they will produce, let him gather the Fruit when they are full ripe, in dry Weather, if possible; then put them into the Vat, and have them trodden by Men to press out the Juice without breaking the Stones; or where the Quantity of Grapes is not large, to press them with the Hands will do as well, and seems more cleanly: The Liquor thus press'd should stand in the Vat about fifteen Days with the Husks and Stalks in it to ferment, if the Grapes were dry when they were gathered, otherwise not much above half that time before the Wine be drawn off, lest it turn sour, as it will be apt to do if the Grapes were gather'd wet. Some who are very curious in their Wine, pick off the damaged Grapes from their Stalks, before they make the Wine, which is so rich in its Flavour, that to compare it with the Wine made the common Way from the same *Vineyard*, it does not appear to be of the same Growth.

It is observable, that according to the Management of the *Vines*, the Wine is stronger or weaker: Those *Vines* which have their Liberty to run up high Trees, and are never pruned, afford the smallest Wines; others which are kept pruned, and have their Branches ty'd to Stakes about four Foot high, make stronger Wine than the former; but the strongest of all is made of those Grapes which

which grow near the Ground, as I have directed, and are sometimes after gathering hung up to dry for three or four Days before they are press'd, which they say exhales the watery Parts.

S E C T. II.

Of the F I G.

THE *Fig* delights in the same Soil with the *Vine*, and may be propagated either from Suckers or Layers, and also from Seeds. The Suckers are best separated from the old Roots the beginning of *March*, and should then be transplanted without cutting any of their Tops; for this, above all other Trees, suffers most by Amputation, and indeed should never be pruned but in *July*. The Layer should be order'd like those of the *Vine*, and the Seeds, as I have been inform'd, will readily come up if they are sown in Rubbish, or such like Soil, about *March*. It is most commonly practis'd in *England* to plant *Fig-Trees* against Walls, because it has been thought the Fruit will not otherwise ripen in our Climate, but that is a Mistake; for in several Gardens about *London* I have seen them grow in Standards, and prosper and bear Fruit in more Abundance; and much better, in my Opinion, than any I have yet seen against Walls, for as they are endanger'd by pruning, so they like as little the Confinement they are oblig'd to against Walls.

I have been told of a *Fig-Tree* near *Windsor* (that grows wild, without Culture, in an old Gravel-pit) which is so extremely large, that many Bushels of *Figs* are gather'd Yearly from it; and I know of some old *Fig-Trees* that have been neglected

lected for many Years, which bear more Fruit than any that I have ever seen dress'd and order'd in Gardens; and it is the common Practice Abroad to plant them in certain Places of their *Vineyards*, and let them grow after their own manner without any Interruption, so that with very little Difficulty this Tree may be cultivated. The only Art required in its Management, is to preserve the second *Figs* during the Winter, that the severe Weather do not make them fall from the Tree, but that they may be maintain'd in Health to ripen early in the Summer. I remember to have seen at Dr. *Compton's*, late Bishop of *London's* Gardens at *Fulham*, ripe *Figs* in *May*, which were brought to that forward Perfection by keeping them in Pots, and sheltering them all the Winter in a *Green-House*.

Tho' with us we have not many Varieties of this Kind of Fruit, yet are there as many Sorts of *Figs* as of any other Fruit, which in *Spain* and *Italy* are held in great Esteem. The *White Figs* chiefly are valued by the curious for their delicate Flavour, and early ripening.

S E C T. III.

Of the *L'AZZAROLE*.

THE *L'Azzarole*, or *Neapolitan Medlar* is a kind of *Service*, producing very pleasant Fruit, as I have heard from some curious Gentlemen who have eaten of it in *Italy*, where it grows frequently: Of late Years it has been brought into *England*, and cultivated in several Gardens, where, I am inform'd, it has produc'd Fruit; it boldly resists the Severity of our Winters, and is well

well inclined to grow with us either in Standards or against Walls. I have propagated it three several Ways, by budding it upon the *Hawthorn* in *July*, by grafting it in the Cleft in *March*, and by inarching in *May*, so that the Admirers of this Fruit may be easily stock'd with it, if they are provided with a Nursery of *Quickset*. It loves a holding fat Soil.

S E C T. IV.

Of the MULBERRY.

WE have two Sorts of *Mulberry*, the *Black* and the *White*; the first is the most common in *England*, a slow Grower, and chiefly famous for its Fruit; and the *White Mulberry*, which grows extremely quick, has indeed a small insipid Fruit, but is no less deserving than the other on Account of its Leaves, which are the proper Food of the *Silk-Worm*.

The *Black Mulberry* is an Autumn Fruit, so tender when it is ripe, that it will not bear the most gentle Carriage without bruising; it is a Catkin-bearing Tree, producing Male and Female Blossoms at the same Time, and it is noted by some, that it never buds till the Weather be settled warm; wherefore it has been laid down as a Rule, that *Orange-Trees* may be brought out of the Conservatory, as soon as its Leaves are as large as a Crow's Foot.

I do not remember ever to have seen this kind of Tree with a strait Stem of any good Height, nor will the common way of raising it, ever produce (in my Opinion) any better than I have seen; 'tis therefore I would advise that it
be

be inoculated or grafted by approach upon Stocks of the *White Mulberry*, which naturally grows strait, and will make a handsome Tree very quickly. I am well assured this would do much better than raising them by Layers, which is the common way, or from Seed, as some have practis'd.

The *White Mulberry* may be increas'd either by Seeds sown in *March*, or laying the youngest Shoots into the Earth at that time. The Seeds will sprout about three Weeks after sowing, and be near six Inches high the first Summer, and the Layers will be fit to take off the Spring after they are laid into the Earth,

By either of these ways we may soon raise Store enough of young Plants to supply a large Quantity of *Silk-worms*; for which end the *Chinese*s sow large Fields of this Sort of *Mulberry* to mow them down from time to time as they have Occasion; and the People of *Italy* plant Trees in the Roads, and every vacant Corner of their Ground. I have heard of a Man near *Utrecht*, who has lately begun the Trade of Silk, and in the Year 1716, as I am inform'd from good Hands, made ten or twelve Bales of *Silk* from his own *Worms*: And, as far as I can understand, were *Silk-Worms* more regarded in our Climate, they would do as well with us as they do in *Italy*, where they are subject to so many Hazards, but chiefly to be spoil'd by the violent Thunders frequent in those Parts: No Man there is certain of a good *Silk-Harvest*, till the Worms have actually spun their *Silk*; for if Thunders happen to come just when the Worms are going to spin, they will immediately drop and infallibly perish. It would be well to try whether the firing of Guns near such Trees as are infested with Caterpillars, will not destroy those Insects.



C H A P. II.

*Of Kernel-Fruit; such as the APPLE,
PEAR, MEDLAR, and QUINCE.*

S E C T. I.

Of the APPLE-TREE.

THERE is no kind of Fruit better known in *England* than the *Apple*, or more generally cultivated. It is of that Use, that I hold it almost impossible for the *English* to live without it, whether it be employed for that excellent Drink we call *Cider*, or for the many Dainties which are made of it in the Kitchen: In short, were all other Fruits wanting to us, *Apples* would make us amends.

It may therefore be expected that I should be the more particular concerning the Culture of this Tree; but considering how many have writ of its Management, and how generally it is propagated with good Success, I shall not enlarge upon it so much as otherwise I should have done.

To set down the several various Names of *Apples*, would be a Work almost impossible, seeing how many various Kinds are yearly produced from the Kernels, in almost every County in *England*; and where they happen to prove good, either for making *Cider*, or Table-use, have Names

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given them according to the Mind of the Person that rais'd them: However, as every kind of *Apple* will not do well in *Espalier*, I cannot well avoid mentioning those few Sorts which I have approv'd to be the most proper for Hedges; and the rather, because their Names are generally known to every Nursery-Man about *London*. For that Use then, the *Codlin*, the *Nonpareil*, *Golden-Pippin*, *Kerton-Pippin*, and *Holland-Pippin*, seem to be the best. I have found these Kinds to bear plentifully, and produce Fruit upon their lowest Branches; and I am persuaded whoever delights in Gardens will not be without *Espaliers* of them, as well for the sake of the great quantity of Fruit they will produce, as for the Ornament they afford to a Garden, and the good Shelter they yield to all the under Race of Kitchen-garden Plants, which are encompass'd with them.

I have found this good by inclosing the Quarters of a Kitchen-garden with *Espaliers* of Fruit, that as they lose their Leaves in the Winter, they then obstruct none of the Sun's Rays from passing directly to the Herbs planted within them; and in the Summer, when they are cover'd with Leaves, they afford that Shade which is so requisite for the good Growth of many Plants; and besides these Conveniencies, being tied up to Poles, and kept in good order, the very Borders they are planted in are as capable of receiving into them Herbs or Flowers, as if they were plain and open, and not any Trees planted on them.

The *Codlin*, which is the first of the *Apples* I have named for this Use, is propagated from Suckers taken from about the Roots either in *November* or *March*, and the other Sorts are increased by grafting upon *Crab-stocks* in *March*. If they are designed for tall Hedges, or if for Dwarfs,
or

or for *Espaliers* of small Heights, then upon *Paradise-Stocks*; the Soil which these and all other *Apples* seem to delight in, is a Medium Earth between Sand and Clay; which they prosper in, if it be fresh, rather than with a Mixture of Dung among it.

I find from Experience, that all *Kernel-Fruit* suffer greatly by Pruning, and it is by the unskilful Management of the Knife they so frequently are apt to canker, and sometimes quite perish; for my own part, that I may somewhat curb the Use of the Knife, I chuse to break off the Buds, which would produce luxuriant Branches, when they first appear, rather than leave them to be cut from the Trees when they are full grown, which is commonly when the Sap is at rest. In *May* it is easy to discern what Buds are shooting for our Use, *i. e.* which will become Branches either to fill the Vacancies of our *Espaliers*, or make Fruit-Branches; and it is at that time that I disbud the Tree of the others, which I esteem useless, for then then the Sap will heal the Wounds.

An ingenious Person, who knows that the Shoots of *Apples*, *Pears*, and such-like *Kernel-Fruit*, will not bear till they are two Years old, will always contrive to lay in Store of Branches every Year into his *Espaliers* to succeed one another in Fruit-bearing; for the same Branches will produce Fruit but once, and when that is over (in *Espaliers*) they should be taken away in proper Season, to make room for the others which are coming forward. Such Pruning indeed cannot be avoided on *Espaliers*, no more than taking away the *Autumn* Shoots; but the disbudding them in *May* will prevent a great deal more, which otherwise there would be occasion for; so that upon an *Espalier* well order'd, we ought to see Wood laid in, of three Summers, the one with Fruit, others to

knot for Blossoms, (which Work Nature always contrives to do in the Bud the Year before they blossom) and the third Sort new Shoots to follow in their turn; for Example, in *August*, there ought to be upon our *Espaliers* about one Third of the Branches with Fruit, one Third of the Branches which have shot in the Year, and the like Proportion of Branches knotted to blossom the next Spring. About *Midsummer* is the best time to tie the Shoots of that Summer to the *Espalier*, and disburden the Tree (especially if it be weak) of its superfluous Shoots; let the Branches be tied about four Inches apart at least, for nearer than that Distance would be too close: Hedges thus dress'd would not be subject to over-bear themselves, but give every Year a moderate Proportion of Fruit, large and good.

It is observable, that some of the Summer-kinds of *Apples* and *Pears* will produce Fruit upon the Branches that shot the Summer before, and upon such Trees the Wood of two several Years may only be left; but the Winter-fruits which ripen late, are always the Produce of older Wood.

Between Leaf and Leaf the Gardeners commonly find a time to prune off all the *Autumn* Shoots, as well from their Standard-Trees, as from their *Espaliers*; and then disburden them from such Wood likewise as they judge unprofitable; but the Skillful have always this Rule before them, that the most weak Trees are first pruned, and those which are very luxuriant are left till *March*.

The Planting of *Apples* or *Pears* for *Espaliers* is best done at the Fall of the Leaf, leaving about ten or twelve Foot between Tree and Tree, and
the

the Rails made of *Aspen Poles* may be put up the following Summer.

For *Dwarf-Apples*, I believe every one will allow that those grafted upon *Paradise-Stocks* are the best; I mean for their keeping in a small compass, and bearing abundance of Fruit with very little Pruning: I have known them frequently cultivated in Pots, sometimes so full of Fruit, that the *Apples* themselves have weighed more than the Tree and the Pot they grew in. At great Entertainments how delightful would it be to set several Sorts of *Apples*, growing, upon the Table? It would be a kind of moveable Orchard, which could seldom fail to bear good Fruit, as the Trees might be shifted from place to place, either to put them out of the way of Blasts, or place them in the Shade for Improvement of the Growth of the Fruit, and in the Sun for the due ripening them.

Paradise-Stocks are raised with us by planting the Cuttings or Suckers of them in *Autumn*; they strike root, and grow freely, so as to be fit to graft on in two or three Years: They are brought originally from *France*, but now they are to be met with in almost every Nursery about *London*: And for *Standard* and *Hedge-Apples*, *Crab-Stocks* taken out of the Woods, or *Seedling-Plants* of about three Years old are the best.

There are two Ways of planting an Orchard; the one to make it entirely for Fruit, the other to plant the Trees at such Distances as to admit of an Under-crop. I must confess, was I to make an Orchard to please myself, I would first divide the Ground into Parcels, allowing handsome Walks between them, which should some of them be fenced on the Sides with *Espaliers* of Fruit, others left open with Borders only on their Sides, adorn'd

with Rows of *Standard-Apples*; such as *Golden-Pippins*, *Golden-Renets*, *Russet-Pippins*, *Kitchen-Renets*, *Pearmains*, *Green-Russets*, and such-like serviceable Fruits, that will remain good for several Months.

In these several Quarters plant your Trees at about sixteen Foot distance, if you design a close Orchard; or near thirty Foot asunder, if the Ground is designed for *Beans*, *Peas*, or such-like Under-crops. In planting this Ground for either Purpose, supposing it three Acres, let two Thirds at least bear *Apples*, and the Remainder be allotted for *Pears*, *Plumbs*, *Cherries*, and a *Mulberry-Tree* or two. The Ground thus planted may be fenced about with Hedges of *Filberds* and *Barberries*, to make it still the more compleat and delightful.

S E C T. II.

Of the PEAR.

THE *Pear*, in my Opinion, is a Fruit no less pleasant than the *Apple*, although it is not of that general Use: However, we are beholden to it for no small Entertainment in the Winter, when other Fruits are scarce; whether we eat them raw, or baked, they have their Excellencies. The Varieties of *Pears* are almost without number, if we were to join the several *French Sorts* to the Catalogue of those raised in *England*; but as I suppose every one would rather propagate a few good Sorts that bear well, and follow one another in right Season, than crowd his Garden with useless and unprofitable Trees,

Trees, I may therefore be excused inserting a tedious List of their Names, and give the desired Satisfaction to my Reader, if I mention only those Kinds that may bring him Profit and Pleasure, and those I shall set down, as near as I can remember, in the Order they ripen. The first ripe is the little *Muscat*, and then I would recommend the *Katherine-Pear*, which is indeed a common Fruit, but is nevertheless of an agreeable Flavour. The *Windsor-Pear* likewise is, in my Esteem, tho' it is an *English* Fruit, worth our propagating. About the same time are ripe the *Queffe-Madam*, *Summer Bon-Cbretien*, and *Summer-Bergamot*, and indifferently good, but especially the latter: Then the *Orange-Bergamot*, and the first *Buree-du-roy*, exceeding good; and after these the *Lemon-Pear*, *Bergamot*, *Grey-Bury*, *Verte-Longue*, *Green Sugar-Pear*, *Messire-Jean*, and *Crysan*: Then ripens the *Winter Thorn-Pears*, *Virgulus*, *Leschaffaries*, some of which last continue Part of *December*, in which Month the *S. Germain* and *Martins* Pears are also ripe, and will hold good all the *January* following, till the *Winter Bon-Cbretiens* supply their Place; all these are Eating Pears. And for the Baking Kinds that are the best I know of, they are the *Wardens*, *Black Pear of Worcester*, and *Spanish Bon-Cbretien*; these, if they have time enough to stand in the Oven, will bake extremely tender, and very red; but particularly will be of a most beautiful Colour, if they are baked in Tin or Pewter Vessels close cover'd, as has been often experienced; but indeed, 'tis no wonder if by these Means they are better colour'd than those that are baked in Earthen Ware, if we consider that 'tis a Solution of Tin Ore that makes the so much admired

* *Bow-Dye* : And I doubt not, but if such as dye Scarlet made use of Tin or Pewter Vessels, rather than Copper, it might save them somewhat in the Expence of *Cochineal*, or such other chargeable Ingredients. *Pears* are either grafted in *March*, or inoculated towards the latter end of *June* ; and two Sorts of Stocks are made use of for those Purposes, Wildings, and Kernel-Stocks ; and oftentimes such as are taken from about the Roots of old Trees, and planted in Nurseries, are good for *Standard-Pears*, because they put the Graft or Bud forward, and tend to make large Trees ; but *Quince-Stocks* are much better for such *Pears* as are design'd for Dwarfs, low Walls, or *Espaliers*, because they confine the Growth of the Graft or Bud, and produce Fruit quickly, and near the Ground.

The Soil which the *Pear* chiefly delights in is a moist Earth, inclining to Clay ; nay, I have seen this kind of Tree prosper extremely in the strongest Sort of blue Clay, which is accounted the worst of Soils ; so that this Sort, no more than the Apple-Tree, delights in what we call rich Earth. If indeed one of this sort of Trees seems to decay, encourage it at the Root with Carrion, or the Blood of some Animal, for that has a wonderful Effect upon all kind of Fruit-Trees ; and I believe would have the like upon every sort of Vegetable, as we have experienced Shavings of Horns, Scrips of Leather, Wool, or the Entrails of Fowl, or such-like Parts of Animals, will have upon those Plants whose Roots they are laid to. It seems therefore as if the Animal
and

* *A little Village, within four Miles of London, famous for its Water.*

and Vegetable were made for the Support and Food of each other ; the Plants to nourish the living Animals, and the dead Animals to feed the Vegetables.

In the Pruning of *Pear-Trees*, the same Method ought to be observed as for *Apples* ; they delight not in a Knife, and especially those grafted upon *Quince-Stocks*. Upon the cutting off any large Branch, (if it happen to be necessary) cover the Wound with a Mixture of Tar, Rozin and Pitch, immediately after the Amputation, which will prevent ill Distempers which the Wound would otherwise be apt to bring upon the Tree.

I am no Admirer of *Dwarf Pear-Trees* in a Garden, because their Figure is commonly too much study'd, and confin'd, to afford us a good quantity of Fruit ; for it is almost impossible to have both together in Perfection ; and besides, they take up too much room. I remember a fine Seat near *London*, where, about six Years ago, the Gardens abounded with *Dwarf Pear-Trees* ; which, although they were planted with tolerable good Skill, never produced any quantity of Fruit : Till at length I had them laid into *Espaliers*, and have bore Fruit every Summer since in great plenty ; and I believe there was not gain'd to the Garden less than half an Acre of Ground, by that Disposition of them.

Let such *Pears* as are planted against Walls be well secured from the *East* ; for although the Fruit in its kind be good and hardy, the Eastern Blasts of the Spring coming upon it, thickens the Rind, and fills the Fruit full of Knots as hard as Stone.

The *Espaliers* for *Apples* and *Pears* should be about six Foot high, that there may be room enough for the Fruit-bearing Branches to be laid into

into them. And we ought likewise to observe, that the *Summer Pears*, i. e. such as have their Fruits ripen upon the Trees, are the most proper for *Espaliers*, because they are more subject to bear near the Root, which the *Winter Fruits* seldom or never do; so that it would be to little purpose to plant the *Bon-Cbretien*, and such-like lasting Fruits, in Hedges, or against Walls that are not at least ten or twelve Foot high.

There is a Method, which has been experienced by some of my Friends, to transplant large Trees of Orchard Fruit. One of my Acquaintance had an Orchard of *Apple* and *Pear Trees*, that had stood about twenty Years; the Trees were in good health, and bore Fruit plentifully: He had occasion to remove to another Estate, about a Mile from this Orchard, and resolved to attempt the Removal of his Fruit-Trees with him: For which end he open'd Trenches about the Roots in *November*, and at the same time made preparation to receive them into his new Garden, by making Holes big enough to admit of the Clods of Earth he designed to transport with each Tree. Soon after, the Frosts began to be violent enough for his Purpose, and so harden'd the Earth about the Roots, that with Leavers he rais'd his Trees out of the Ground, without breaking any of the Earth from them, and convey'd them upon Sledges to their several Stations in his new Garden, where they remained in the State they were brought, without closing any fresh Mold to their Roots till it began to thaw; and then he finish'd his Work by filling up the Trenches, and treading down the new Earth very close.

About a Month after they were thus fix'd, he discreetly pruned off about one Third of their Boughs,

Boughs, as near as he could guess, to answer the Quantity of Roots they had lost, and the following Summer had a good Parcel of Fruit upon them. No less useful than this Method would be the Removal of young Trees at *Midsummer*; which will succeed very well, as I have experienced. As I conceive the Sap of every Tree to be at rest about *Midsummer*, their Transplantation may then be perform'd with as much Reason, as the Removal of them at the common Seasons used for that Work; for they have then more time to strengthen themselves, and form their Roots before *Winter*, than those planted at *Autumn*, and will undoubtedly be better prepared to make strong Shoots than any Trees that are planted in the *Spring*. Those Trees that shed their Leaves, will fare as well by this Method, as *Ever-Greens*, if their Roots do not dry.

I shall now conclude this Section with acquainting my Reader, that such Fruit as does not ripen upon the Trees, should not be gather'd till *Michaelmas*; and then only in dry Weather, if possible, without bruising, and laid singly upon Shelves cover'd with dry Moss, if it can be got; or for want of it, upon Wheat-Straw, giving it Air by opening the Windows of the *Fruiter*y, (or Room it is laid in) till the Frosts begin. Some choice *Pears*, which ripen late in the Year, may be yet preserved by hanging them up by the Stalks to the Ceiling of the Room; and I have known some curious Persons wrap them in Paper, and hang them up till they are fit to eat,

S E C T. III.

Of the MEDLAR, and QUINCE-TREE.

THE *Medlar*, contrary to all other Fruits, is not fit to eat till it is rotten or decay'd; and as it is then agreeable to some Palates, I shall therefore give the Culture of it. It delights in loamy, wet Soil, and requires little Sun. It is propagated by grafting it upon the *Hawthorn* in *March*, and is only fit for Standards, in the most remote Parts of the Garden.

The *Quince* is raised either from Layers, Cuttings, or Suckers taken from the Root: It is a natural Fruit, which does not require grafting, and comes early to bear: The young Twigs may be laid into the Earth, in *February*; or the Cuttings, planted in *October* or *November*, strike root without difficulty. This Plant loves a moist Soil, and Shade; and the Fruit, in my Opinion, exceeds all others for baking.



CHAP.



C H A P. III.

*Observations and Experiments relating to the
Propagating and Culture of Stone-Fruit-
Trees.*

THE Fruits which may be comprehended under the Title of *Stone-Fruits*, are *Peaches*, *Nectarines*, *Apricots*, *Plums*, *Cherries*, and *Almonds*; all which (the *Cherries* excepted) are so nearly ally'd, as to make, as it were, one Family. What Directions I shall lay down for their Management, will rather be in general than in particular, seeing how impossible it is to know every particular Soil, or the Disposition of every different Tree; which, if they were known, would require as many various ways of ordering. Monsieur de la Quintinye has indeed given us a very elaborate Piece relating to *Fruit-Trees*, endeavouring to ascertain the Method of pruning them: But how seldom do we meet with any Trees just in the same State of those he mentions? and if by chance we do happen to find such, how difficult is it to comprehend rightly his Meaning? I cannot therefore avoid giving all due Commendations to the ingenious Mr. *Laurence*, who is the first I know of that has reduced those Difficulties in the ordering of *Fruit-Trees* to plain Reason, and has given us such useful Experiments, whose Consequences may best lead us to the right way of Practice in this Point. To proceed then upon the Foot of Reason and Experience, as far

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as my Capacity will permit, I shall begin with some Observations upon the Nursery, whose Soil should be inclining to Loam, a medium Soil between Sand and Clay, and not any ways enrich'd with Dung; for if the Nursery be richer than the Garden, the Trees never thrive when they are transplanted; therefore always contrive to plant them from bad into good Ground. About *September*, make your Plantations of Suckers taken from the Roots of the *Muscle-Plum*, the *White Pear-Plum*, or the *Black Damask*; which are good to inoculate *Peaches* upon, but must not be budded till *July*, in the second Year after they have been planted in the Nursery. I have observed, that *Peaches* prosper well that are budded upon *Almond-Trees* raised from the Stones. *Almonds* are to be put in the Ground as soon as they are ripe, and in one Year's Growth may best be inoculated, for they are too apt to Gum when they are older.

Nectarines and *Apricots* may likewise be budded upon any one of the *Plum-Stocks* I have mentioned taken from thence, and will prosper much better than if they were inoculated upon the best Sorts of *Plums*.

The Stones of *Black Cherries* should be set or sown in *Autumn*, to raise Stocks to graft all other Cherries upon: They should be planted out the second Year after they are come up, in Lines about two Foot a-part; and the like Distance should be preserved between all other Stocks that are design'd to graft on.

Cherries prosper best if they are grafted; which is contrary to *Peaches* and *Nectarines*, that will rarely be made to thrive, but by Inoculation: All these are subject to Gum, which *Kernel-Fruit-Trees* are not; but the *Peach-Trees* and *Apricots* suffer

suffer the most by it, and often lose whole Arms by a Canker that always attends the *Gum*, which comes commonly by unskilful Pruning, but more especially by cutting into the Wood at the *Midsummer* Pruning; therefore, at that Season, take off as few Shoots as possible near the old Wood, but nail up slightly as many as can conveniently be laid to the Wall, to be more regularly disposed the *February* following, which is the best Season for the capital Pruning of *Stone-Fruit-Trees*; then may every bearing Shoot be topp'd or cut, to leave about six or eight Inches, according as they are strong or weak, and all cross-growing Branches, dead Wood, and the Shoots of two or three Years old, must then be entirely cut out; for it is a certain Rule, that all *Stone-Fruit-Trees* only bear Fruit upon the Shoots of one Year old; which may be distinguished from barren Shoots, by being smaller, and better supply'd with Buds. I would advise, that a Mixture of *Tar*, *Pitch*, and *Bees-wax* be laid upon any capital Wound, or else that it be burnt with a hot Iron to prevent *Gum* issuing from it.

I account List of Cloth to be much better for the nailing of these Trees than Leather, which is apt to shrink by Change of Weather, and bind too much the Shoots which are encompass'd by it: It is by such Bindings, that oftentimes good Branches are wounded, and by that means perish; and therefore it is good to let them have room enough allow'd for them to swell, without any Pressure upon them. In *Holland*, and some Part of *Flanders*, they have Frames of Wood in the manner of *Espaliers*, set against their Walls, about four Inches distant from them; and the Reason the Gardeners there give for so doing, is not (I think) unworthy our Regard. In the first place, they

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they say, that their Trees being four Inches distant from the Wall, the Fruit is not apt to be destroy'd or spoil'd by Vermin, nor bruised or grow misshapen: They say farther, that the Wall reflects a Warmth to that Side of the Fruit growing next to it, which has the same Effect as to the ripening of it, as if the Sun was to shine on both Sides of their Fruit, and so prevents that unequal Relish which is found oftentimes in one single Fruit, which grew close to a Wall. To which they add, that in this Method, the Trees need not be planted so close to Walls, as to want a sufficient Quantity of Earth on every Side of their Roots, which those commonly planted in the ordinary way, must do on that Side next to the Wall; and also that the Twigs of the Trees being tied with *Bast*, saves the Expence of *Nails* and *Shreads*, and will not be subject to canker by too streight binding. And if I may add one Reason more towards the recommending these *Wall-Espaliers*, (if I may so call them) it should be, that those Poles, which run horizontally, may be so contrived, as to serve for Shelter to the *Blossoms* and young *Fruit* from those *perpendicular Frosts*, which oftentimes are so injurious; as the curious Mr. *Laurence* judiciously observes.

I have mention'd, among other Observations in the Chapter of *Kernel-Fruits*, that the Easterly Winds commonly are apt, when they blow directly upon *Pear-Trees*, to spoil the Fruit, by filling it with stony Substances; and no less prejudicial are they to the Blossom of every forward-blowing Tree, if it lie in the way; therefore I cannot recommend the Planting of *Apricots* in such Places, where the East Winds may blow upon them; for I observe, that in *March* those Winds are always most frequent; and if they happen to come with-

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out Wet, they are infallibly attended with Blasts ; as I shall endeavour to explain in another Place. I find that *Apricots* planted against a West Wall, where they are shelter'd from these murdering Winds of the Spring, seldom fail to produce good store of Fruit ; while, on the other hand, all others in different Exposures often fail of Fruit, unless they have been guarded by artificial Shelters, such as I have seen in the Right Honourable Earl *Parker's* Gardens, (I think) contrived by his Lordship ; they are Matrasses of Straw, fix'd in Frames of Wood about four Foot wide, and seven or eight Foot high, which are made to remove at pleasure ; so that they may always be so placed, as to interpose between the Wind and the Tree, without stifling the Blossoms, or breaking them off, as Mats commonly do.

In the Grafting or Budding of *Stone-Fruit*, I have observed, that such Trees as are inoculated near the Root of the Stock, are much more apt to shoot out unprofitable, luxuriant Branches, than those that are budded or grafted five or six Foot from the Root. I find the latter to make Fruit-branches in such plenty, that hardly any barren Shoots are found upon them ; which seems to happen for the same Reason I have mentioned elsewhere, that too great plenty of Nourishment is ever a hindrance to the bringing forth of Increase, as well in *Animals* as in *Vegetables* ; and that a Luxuriance of Growth in either, must always be check'd to make them prolifick ; so the Length of Passage in these Standards, which the Sap takes in its Ascension from the Root, thro' the *Plum-Stock*, before it reaches that Part where it is to alter its Property, in the Bud of the *Peach*, must, I think, contribute to weaken it, and rob it of that Luxuriance which it would have had, if it

had been permitted to push out Branches near the Root, where undoubtedly it was more strong and vigorous.

The several Kinds of *Stone-Fruit* may have different Situations and Exposures; *Peaches*, for example, and *Nectarines*, with some forward *Cherries*, such as the small *May Cherry*, and the *May Duke*, with a forward *Plum* or two, should have a South Wall; and if the Wall happens to be very high, I would advise it to be planted double, (*i. e.*) with Dwarfs and Standards, that it may the sooner be cover'd.

Apricots, some choice *Pears*, and a few *Peaches*, may be the Furniture of a West Wall; and some forward *Grapes*, (for they blossom when Blights are commonly past) with some *Plums* and *Duke Cherries*, against an East Wall; and to the North Aspect we may set *Plums*, some *Winter Pears*, *Carnation* and *Morella Cherries*, with some *Golden Pippins*.

Plums will also do well in Standards; and all Sorts of *Cherries*, excepting the small *May*, and the *May Duke Cherries*, prosper best when they have liberty. *Almonds* likewise will bear very well in the open Ground; and the *Brussels Apricot*, whose Fruit is so excellent, will bear plentifully without the help of a Wall.

The *Peaches*, which I most covet, are the *Nutmeg Peaches*, for the sake of their early ripening; the *Common Minion*, *Milet's Minion*, *St. Laurence*, the *White Magdalen*, the *Old Newington*, *Belgard*, the *Admirable*, and the *Katherine Peach*, which comes late, and is a certain Bearer. Of *Nectarines*, Mr. *Whitmill's Early Nectarine*, the *Red-Roman*, and *Orange-Tawny Nectarine*. *Apricots*, the *Masculine Apricot*, the *Orange*, and the *Turky Apricots*, for Walls; and for the Standards, the *True Brussels*.

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Fig. III



Fig. VI.



Fig. V.

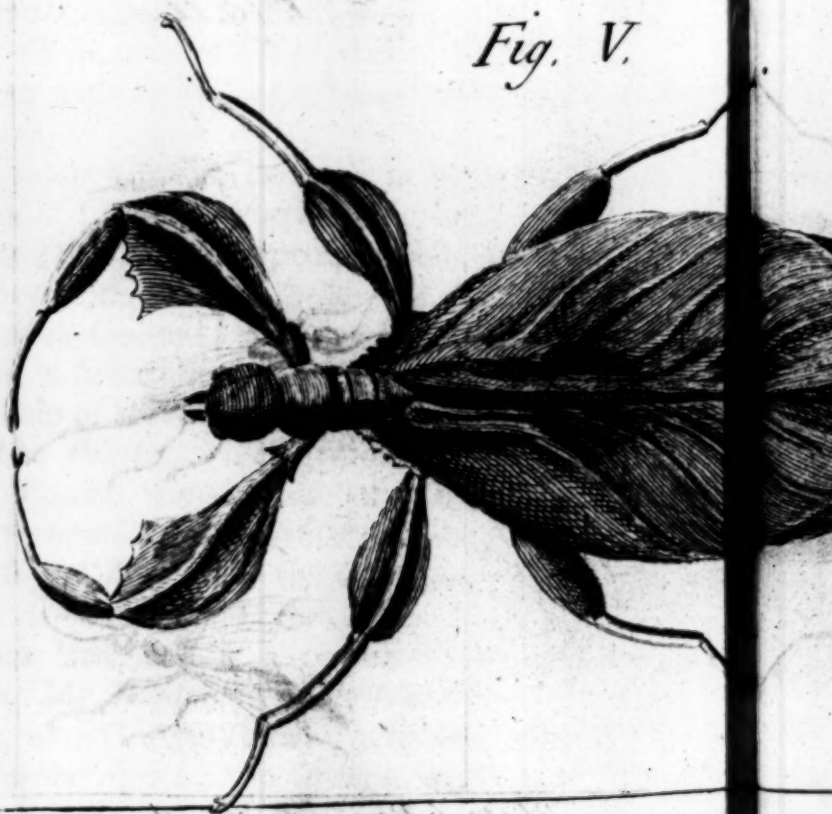


Fig. I



Fig. III



Fig. II.



Port



North



Fortification

Brussels. Plums, the Morocco, Imperial, Orleans, Musclee, the two Pedrigons, Queen Mother, Green Gage, Violet, Apricot, Damascene, Cloth of Gold, or Drap d'Or, Royal, Bonum Magnum, and the White Pear Plum; to which we might also add the Damfin, which, in my Opinion, is not without its good Qualities.

Cberries, the Early, or May Cherry, the May Duke, the Black-Red, and White Heart Cberries, the Carnation, the Morella, the Flemish Cherry, and the Common Black; and also the Cluster Cherry, well enough deserves a Place in our Gardens for the Curiosity of its Fruit.

There have been several Ways practised to forward the Ripening of Fruit. The late Marquis of *Wharton* had a Glass-case made on purpose for that end; and by the help of Fire against the Back of the Wall the Trees were nail'd to, and under the Roots of the Trees, had several Kinds of Fruits very early. But of all the Inventions that I have yet seen or heard of, the Contrivance of the ingenious Mr. *John Millet*, Nursery-Man at *North-End* near *Fulham*, is to be prefer'd. I have seen in his Garden ripe *Cberries* in *February*; and *Apricots, Roses, and Junquils*, above three Months before their natural Season; and those not in small quantities, but in as great abundance as if they had been the Product of Nature alone: And this he does with the assistance of Horse-dung, judging it to yield a more gentle sweating Heat than Fire, and is therefore more natural to Plants.



C H A P. IV.

*Of the GOOSBERRY, CURRANT,
STRAWBERRY, RASBERRY,
BARBERRY, and FILBERD.*

ALTHO' the Fruits which I design to treat of in this Chapter, are so commonly known, that there is hardly any Garden without them; yet I am apt to believe, the right Method of raising them and ordering them is not every where understood.

Of the *Goosberry* we have the following Kinds, which are chiefly worth our Notice, *viz.* the large *White Dutch Goosberry*, which produces an excellent Fruit for eating; the large *Amber Goosberry*, which I think is better for baking while it is green, than to be kept till it is ripe; the *Walnut Goosberry*, which exceeds all others for the Largeness of its Fruit, which may be gather'd for baking sooner than any other; and the *Champain Goosberry*, which is ripe at least a Fortnight before any of the rest; and besides these, the *Black Hairy Goosberry* is pleasant enough. If I should here enumerate all the other Sorts I have seen, it would be to little purpose, seeing every Year is likely to produce new Varieties from Seeds; and the Rules for the Culture of any one Sort will suffice for the rest that are, or can be raised.

This kind of Shrub may be propagated either by Seeds, Suckers, or Cuttings; the first may be
sown

sown as soon as they are ripe, and will come up the Spring following: The Suckers should be taken from about the Roots of old Trees, when their Leaves are fallen, in open Weather, and transplanted in Nurseries; and the Cuttings likewise will take root, if they are planted in September or October. These Plants require a strong, holding Soil, and may be transplanted in October with more Safety than in the Spring.

We have three Sorts of *Currants* very different from each other, viz. the large *White Dutch Currant*, the *Dutch Red Currant*, and the *Black Currant*: The first is an admirable Bearer, and will sometimes produce Fruit as big as some Sort of *Grapes*, but I think are not so pleasant to the Taste as the *Red Currants*. The Kind which bears the Black Fruit, for Variety sake, as well as on account of its great Virtue in Medicine, should not be wanting in a Garden, tho' scarce one in twenty can like its Flavour. These may be propagated like the *Goosberry*, and delight in the same kind of Soil. I have known a curious Man, when the Fruit has been just ripe, tie up some of the *Red Currant* Bushes in Mats, to preserve the Fruit upon them till *August* or *September*, and sometimes later in the Year; and it is practised by some to plant them against Walls, to make the Fruit come larger; but I have never found 'em half so sweet as the Standards.

Both the *Goosberry* and *Currant* ought to be kept free from old Wood, never leaving on the Plants any Shoots (if possible) that exceed three Years Growth; for the largest Fruit is always found upon the youngest Branches: These Fruits are ripe in *July*.

We have four Sorts of *Strawberries*; the *Scarlet*, the *Hautboy*, or *Great White Strawberry*, and the

Wood Strawberry, both *Red* and *White*. The first is ripe much sooner than either of the other, especially if it has had the Benefit of a good Exposure, and a light Soil, which always contributes to quicken Vegetation; however, *Strawberries* delight not in any Ground so much as that which inclines to Clay: 'Tis in such Land we can only expect their Fruit to be large, and in abundance; witness the great Profits which the Gardeners about *Hammer-smith* (where the Soil is proper for making of Bricks) draw yearly from their Plantations of this Sort of Fruit.

The *Great White Strawberry* ripens next after the *Scarlet*; and last of all, the *Wood Strawberries*, which continue a long while, but chiefly if they be kept shaded after they begin to ripen.

As I know no Place where *Strawberries* are so generally propagated, as about *Hammersmith*, so I shall prescribe the same Rules for their Management, as are commonly practised by the Gardeners of that Place.

They provide a Parcel of Horse-dung and Coal-ashes, well mix'd and incorporated together, and lay on a sufficient Quantity of it upon their Land, to be dug or trench'd in *February*; then they lay up their Borders three Foot wide, and thereon plant the Slips of whatever Kind they see convenient, at about eight Inches apart; after which they set *Beans* for a Crop that Summer; for the *Strawberry Plants* will not begin to bear Fruit to any purpose till the Year following, and even then, not comparable to what they will produce the Year afterward, which is the third Year after planting; 'tis then they have full Crop, if extraordinary Drought does not hinder. But I should have also added, that after the laying up of the Beds, that at every five or six Foot distance, they plant *Roses*,
Gooseberries,

Gooseberries, Currants, or Sweet-Briar; which turn to good account at the Markets, besides the Advantage of the Shade those Plants give the *Strawberries*.

From a Piece of Ground thus planted, it is hardly to be imagined what Advantage arises to the Gardeners, if they are diligent to keep their Crop weeded, and well water'd, if the Season of their Blossom be dry.

Early in the Spring they clean them, and fling Earth among them to strengthen their Roots; and that the Ground may not lie too long idle, they plant *Savoy*s and *Cabbages* in the Allies for the Winter. A Piece of *Scarlet Strawberries*, so order'd, will remain tolerably good for about five or six Years; but the *Hautboy* and *Wood* Kinds should be renew'd once in three Years, always minding to get the *Wood-Strawberries* fresh from the *Woods*, and not make use of Slips from the Garden, for those degenerate.

But there yet remain many Particulars relating to *Strawberries*, which are not practis'd by these Gardeners; as the Stringing them, or Pulling off their Runners, in *July*, where the Roots are weak especially, so as to leave all the Plants single; which is practis'd by some to make the Fruit large.

Again, to make them bear Fruit in the *Autumn*, cut down the Leaves and Flower-stems just before the Blossoms open, and they will shoot out fresh, and bear ripe Fruit about *September*; as I have experienced.

Now, if it is desired to have ripe *Strawberries* in *March*, it may be done by planting some strong Roots in Pots, and putting them on a gentle Hot-bed in *January*, giving them what Air may be convenient till they blossom, and moderate Waterings

at that time, with Water a little warm'd. By these Instructions, and the Care of an ingenious Gardener, who will rightly defend them from Frosts, or too sharp Winds, we may have them produce Fruit as I propose. I cannot conclude the Culture of this Plant without mentioning, that I have made Plantations of them in *April* and *May*, with good Success; and the Second *June* afterwards I have gather'd very good Fruit from them.

The *Raspberry* is the next to be consider'd: We have two Sorts of them, the *Red* and the *White*; the latter is the greater Rarity, but, in my Opinion, it is not of so good a Flavour as the *Red*. These delight in such Soil as agrees best with *Strawberries*, and are propagated by Slips taken from the Roots in *March*, for that is the best Season to plant them in. Some Gardeners plant single Lines of them, leaving the Distance of about a Foot between the Plants; others make Beds for them, of three Foot wide, and plant three Rows in a Bed; both which Ways I find to succeed very well. The first *Summer* after planting they will fling up some Suckers from the Roots, and put out some few Shoots from the old Stems that were left remaining when they were planted; but as those Stems are never left above a Foot long when we plant them out, we cannot expect any Quantity of Fruit from them the first Year, nor indeed any vigorous Shoots from the Roots till the second Year; so that it will be the third *Summer* after planting, before we must expect a full Crop, for the Fruit is always found upon the Shoots of the preceding Year. The chief Culture necessary for this kind of Plant, is to keep them clean from Weeds in the *Spring*, and prune the Tops of the strongest Shoots of the last Year, to leave them about three Foot high; and that Work must be
done

done in *March*; as also to cut away all dead and weak Branches. The *Raspberry* ripens in the Beginning of *July*, and lasts till the End of the Month.

The *Barberry* is a pleasant Shrub, bearing beautiful Branches of yellow Flowers in the *Spring*, and no less delightful Clusters of red Berries towards the *Autumn*. The Fruit is of a sharp Taste when it is ripe, and seldom used any other way than in Sauces. I have been told, that the Leaves of the *Barberry*, when they are young and tender, may be dry'd to imitate the *Indian Tea* which they call *Bohea*; and indeed the Figure of the *Barberry Leaf* is not unlike it. If any one of my Readers shall think it worth his while to make a trial, he may do it after the following manner: Lay the Leaves fresh gather'd upon a Sieve placed over a Vessel of boiling Water till the Steam has soften'd them, then spread them upon a Copper-plate over a gentle Fire, and move them to and fro till they roll up; which is the Method they use for drying their Tea in *China*, as I have heard: But I would advise such as intend to make the Experiment, not to be over hasty in drinking the Infusion of such Leaves, before some skilful Physician has first given his Advice. There are two Kinds of this Fruit; one without Seeds, and the other with Seeds: The first is so rare, that I have yet only seen it grow in the Gardens of my worthy Friend *Samuel Reynardson Esq;* at *Hillingdon*, among his numerous Collection of curious Plants; but the other is found frequent enough in most Gardens. The Plant loves a loamy Soil, and is increased easily by Suckers from the Root, or Layers in the Beginning of *March*.

The *Filberd* is order'd like the *Hazel*, mention'd in the First Part of this Treatise; but is allow'd

allow'd place in our Gardens on account of its thin Shell, which is the only Excellency it has more than the common *Hazel*, in my Opinion, This and the *Barberry* should be planted in the most remote Parts of the *Kitchen-Garden*.

N. B. The *Filberd* may be grafted upon the *Hazel*, and will bear very well.



CHAP. V.

Of BLIGHTS,

AS a *Blight* is the most common and dangerous Distemper that *Plants* are subject to, so I shall endeavour to explain by what means *Vegetables* are affected by it; and if I shall be so happy, from the Observations I have made, to discover the Cause of it, the Remedy may then be more easily found out, and the Gardener will with more certainty hope for Success from his Care and Labour.

I shall be the more particular in discoursing upon this Subject, as it will afford me an Opportunity of opening to the View of my Reader a wonderful Scene of Nature, which hitherto has been slightly touch'd upon by Writers, or overlook'd or despis'd by unthinking Men; and shall endeavour from the whole to draw such Consequences as may be both profitable and delightful.

Plants of all degrees are subject to *Blights*, which are so variously communicated to them, that sometimes a whole Tree will perish by that Distemper; now and then a few Leaves or Blossoms only, and perhaps a Branch or two will be shrivel'd

vell'd or scorch'd by it, and the rest remain green and flourishing. I have yet never observ'd this Disease to happen among *Plants*, but upon the blowing of sharp and clear *Easterly Winds*, which are most frequent in *England* about *March*; but sometimes happen in other Months. It is very observable, that the *Caterpillars* generally attend these Winds, chiefly infecting some one sort of Tree more than another, and even then not every where upon the kind of Tree they attack, but some particular Branches only: From which Observations I think we may draw the following Inferences, either that the Eggs of those *Insects* are brought to us by the *Easterly Winds*, or that the Temperature of the Air, when the *Easterly Winds* blow, is necessary to hatch those Creatures, supposing their Eggs were already laid upon those infected Parts of the Trees the preceding Year.

The *Blights* which are attended with large *Worms* or *Caterpillars*, seem to be rather hatch'd with the *East Wind*, than that the Eggs of those Creatures are brought along with it; but those *Blights* which produce only those small *Insects* which occasion the Curling of the Leaves of Trees, may proceed from the Swarms of them, either hatch'd, or in the Egg, which are brought with the Wind.

Some perhaps may object, that the *East Wind* is too cold to hatch these Creatures: How comes it then, that we find them hatch'd when those Winds reign'd? Or is it reasonable to conjecture, that the same Degree of Heat is necessary to enliven an *Insect*, as is required to hatch the Egg of a Pullet? The *Insects* of *Norway*, *Iceland*, and such-like cold Climes, must certainly have less Heat to produce them, than Creatures of the same Race must necessarily have in those Climates which lie
nearer

nearer to the Sun. Every Creature without doubt requires a different Period of Heat and Cold to enliven it, and put it in motion; which is proved by so many known Instances, that I conceive there is no room for any Dispute upon that score.

But there may yet be another Question, viz. Whether it is not the *East Wind* of itself that blights without the help of *Insects*? But that may be easily resolved on my side; for that if it was the Wind alone that blighted, then every *Plant* in its way must unavoidably be infected with its Poison; whereas we find the contrary, only a single Branch, it may be, or some other distinct Parts of *Plants*.

And again, to shew how reasonably we may conjecture that 'tis *Insects* which thus infect the Trees, let us only consider that every *Insect* has its proper *Plant*, or Tribe of *Plants*, which it naturally requires for its Nourishment, and will feed upon no other Kind whatsoever: Therefore it is no wonder to see one particular sort of Tree blighted, when all others escape; as for example, that Wind which brings or hatches the *Caterpillars* upon the *Apple-trees*, will not any way infect the *Pear*, *Plum*, or *Cherry*, with *Blights*; because, were the Shoals of *Insects* natural to the *Apple*, to light only upon those other Trees mention'd, they would then want their proper Matrix to hatch in; or if they were hatch'd already, they would perish for want of their natural Food: So that it is morally impossible that all Sorts of Trees should be blighted at the same time, unless the Eggs of every Kind of *Insect* natural to each Tree, could be brought at one time with the Wind, or that an *Easterly Wind* could contain in it at once as many differing Periods

Periods of Cold or Heat; as would be required to hatch and maintain each differing kind of those Creatures.

The common People in the Country seem to be of my Opinion, that *Blights* are brought by the *East Winds*; which they are so well satisfied brings or hatches the *Caterpillar*, that to prevent the too great Progress of *Blights*, it is common for them, where the *East Winds* blow, to provide large Heaps of Weeds, Chaff, and other combustible Matter on the Wind-side of their Orchards, and set them on fire, that the Smoke may poison either the *Insects* or their Eggs as they are pass'd along. By this Contrivance I have often known large Orchards preserv'd, when the neighbouring Parts have suffer'd to the Loss of all their Fruit.

And I have also seen these Fires made with good Success to destroy the *Caterpillars*, even after they were hatch'd, and had begun to devour the Trees, by suffocating them, and forcing them to drop to the Ground, where they have been swept up in large quantities and kill'd. I have heard it affirm'd by a Gentleman of Reputation, that *Pepper-dust*, being powder'd upon the Blossoms of any Tree, will preserve them from *Blights*; which may be, because *Pepper* is said to be present Death to every Creature but to Mankind. Now, altho' this last Secret is too costly for common Use, yet it may be of service in some particular Place for the Trial of a new Tree, where a Taste of the Fruit is desired; and besides it helps to inform us, that *Blights* are occasion'd by *Insects* or their Eggs lodging upon a *Plant*, and that *Pepper-dust* will not suffer them either to live or to be hatch'd.

Another

Another Remark (which to me is Demonstration) that *Blight*s proceed from *Insects* or their Eggs (being brought with the *Easterly Winds*) was the total Destruction of the *Turneps* some Winters ago on the West Side of *London*: About *October* we had dry *Easterly Winds* for a Week or ten Days, and several thousand Acres of *Turneps* which were then well grown, turn'd yellow, and decay'd, unless in such Places only as were shelter'd by Hedges, Houses, or Trees, where they remain'd green till the *Insects*, which came with the Wind, in about a Week's time destroyed those also. Some Farmers imagin'd that the Birds, which were there in great Flocks, had eaten the Leaves of their *Turneps*, and contrived all Means possible to destroy them; till I convinced them that the Birds were rather Friends than Enemies, and came there to feed upon the *Caterpillars*, which were in such great numbers, that each *Turnep-plant* had not less than a Thousand upon it. And that *Insects* frequently pass in Clouds and numberless Armies after this manner, is plain from several Instances which have happen'd in my Time, and one of them in a late *Summer* (I think in *June*) one of these Swarms passing over *London* were suffocated (I suppose) with the Smoke of the *Sea-coal*, and dropp'd down in the Streets, insomuch that a square Court belonging to the *Royal Society* was almost cover'd with them. These were of the *Fly-kind*, and fully perfected.

It may be ask'd, perhaps, how these *Insects* came to destroy the *Turneps* only, and not touch the other *Greens* of the *Fields*, as *Cabbages*, *Carrots*, *Parsnips*, and the like? Every Herb has its peculiar *Insect*, like the Trees I have mention'd: Nay, more than this, the *Insects* which Nature has design'd to prey upon the *Flower* of a *Plant*, will not eat

eat the *Leaves*, or any other Part of the same *Plant*. The *Leaves* of *Plants* have their *Insects* natural to them; the *Bark* and *Wood* likewise have their respective Devourers; and those several *Insects* have other Kinds, which lay their Eggs, and feed upon them.

The Flowers of the *Province-Rose*, before they are open, produce and nourish the *Insect* in Figure I of the first Plate, after the Eggs have been laid upon them. A is the *Nympha* or *Caterpillar* which feeds upon the *Rose-buds*. B the *Aurelia* of the same, which for a time lies as it were in a State of Death, fasten'd with fine silken Threads to the Leaves of the *Rose-tree*, and at length resuscitates and comes forth with Wings adorn'd with curious Variegations of Black and Yellow, C, and eats no more. While it lives in this last State, it seems to be the most perfect, by laying then its Eggs upon the Bark of the same Tree, (about an hundred in number) after it has coupled with a Male of its own Tribe. This Process from the Egg to the Fly, is by my late curious and learned Friend Mr. *James Petiver*, F.R.S. made an Emblem of the Resurrection: The *Nympha*, he observes, feeds and grows to a certain degree of Perfection, as all Animals do; then for a time is laid up without Motion in a State of Death, and appears at last in its utmost Perfection, with Wings beautifully adorn'd with pompous Colours, and breathes only the purer Parts of the Air.

The Leaves of *Plants* have also their *Insects*.

The *Silk-worm*, for example, upon the *Mulberry*; the *Common White Butterfly*, upon the *Cabbage* and *Plants* of the same Tribe: And the *Bark* and *Wood* of Trees have also several Kinds of *Beetles*, which prey upon them, and are large enough

enough to be discern'd without a *Microscope*. There are yet other Kinds which are naturally disposed to feed upon the Fruit of Trees, such as we often find in *Apples*, *Pears*, and *Nuts*; and the Roots of Trees are also the proper Food for *Worms* of a different Race from those already mentioned, such as are long, scaly, and have many Feet, by some call'd *Canker-worms*, which, by devouring the Roots of Trees, cause them to languish for a time, and at length die; and the very Pith of *Plants* is not safe from Enemies of this sort: How often are the *Carnations* and other Flowers destroy'd by little Worms which eat their Pith?

And all these, if I mistake not, have their *Ichneumon Flies* which feed upon them; and by the help of fine *Tubes* growing about them, convey their Eggs into the Bodies of the *Nymphæ* or *Caterpillars*, where they hatch as soon as the *Caterpillars* are laid up in *Aureliæ*, and feed upon them till they are themselves perfected, and make their way into the World: This I am sure of in many Cases, as I have seen, when that excellent Lady the late curious Dutchess of *Beaufort* diverted herself with enquiring into the Nature of *Insects*, that the *Aureliæ* of several Months have brought only *Ichneumon Flies* of different Kinds: See *Fig. II. Plate I. N^o 1, 2, 3.* The first is the *Ichneumon Fly*, bred upon the small green *Caterpillar* which feeds upon the red *Sal-low*; the second feeds upon that bred upon *Borage*; and the third feeds upon the *Insect* commonly found upon *Campion* or *Cockle*: And it may be, these *Insects*, which feed upon others, are not without some others of lesser Rank to feed upon them likewise, and so to Infinity; for that there are Beings subsisting, which are not commonly

monly visible, may be easily demonstrated, if there is any Truth in a *Microscope*.

A *Winter* not long ago, during the most severe cold Weather, a Friend of mine was desirous to look into my *Microscope*, and was so impatient, that he would not allow me time enough to provide any new Subjects for the *Glasses*, but contented himself with examining some minute Parts of *Plants* which had lain between the small *Glasses* for above fourteen Months: Among them he happen'd to pitch upon a small *Hair* of the *Leaf* of the common *Moufe-Ear*, when on a sudden he discover'd a living Creature of the figure of a *Beetle*, in appearance an Inch in length, walking between the *Glasses*. He was much surprized to find it so perfect in all its Parts, and gave me the *Glasses* that I might observe it, and delineate it for him; which I did, and by Computation found it to be no more than one thousand times less than the least Dust of Sand visible to the naked Eye. I was then willing to try whether the Cold, which was severely felt by us, was not to that minute Creature equal to the Degree of Warmth which hatches other *Insects* of larger Size; and for that end I held the *Glass* about a Yard distance from a slow Fire, about the tenth Part of a Minute: That trifling Heat to us, was so intense to it, that in that short space of time it was thereby burnt to death, and shrivell'd to a fourth Part of its former Size, and scorch'd out of shape. This brought to my Mind the *Insect* Mr. Ray mentions, which is hatch'd and dies in a Day; and also the several Periods of Life appointed to the several visible Creatures upon Earth: And I could not help reflecting at the same time, that as I found by the help of a *Microscope*, that Quantity was only computed

PART III. Q to

to be great, or little, in proportion to what Objects our Eyes are capable of seeing without the help of *Glasses*; so I also imagined that Space was confined to our Understanding by the same Rule; and that the Life of that Creature which lives only one Day, is of the same Length or Duration to it, in proportion to itself, as the Term of an hundred Years is to Mankind; that is, about three Minutes of that *Insect's* Life is equal to a Year with us; and the coldest Air of the last Winter, to the *Insects* I saw, was equal with the Summer's Warmth to such Animals as then only came abroad: For the Heat which kills this *Insect*, and was as a violent Fire to it, was hardly warm enough to be discern'd by me.

It is wonderful to consider the Fineness of the several Parts of a Creature even so minute as this, (for the *Microscope* has discover'd much smaller) how small must the Organs of its Senses be in proportion to its Body! The Eyes, perhaps, a thousand times less, and the other Parts answerable to them: May we not then reasonably conclude, that with such Eyes it is capable of discerning other Bodies, which are as minute, and of as distant Smallness to itself, as the smallest Creature capable of our Sight is to us? For I think it is plain that every Animal, as their Eyes are greater or smaller, or of different make, have certain Bounds of Sight, beyond which they cannot see without Help, such as the *Microscope*, *Telescope*, &c.

But alas! How trifling an Object was the *Insect* I have mention'd, in comparison to those discover'd by Mr. *Lewenboeck*, in a Quantity of *Pepper-water*, no bigger than a Grain of *Millet*, in which he affirms to have seen above ten thou-

thousand living Creatures; and some of his Friends at the same time witness to have seen thirty thousand, and others above forty-five thousand Creatures moving in that small Quantity of Water: Nay, they tell us, that because they would be within compass, they only related half the Number that they believ'd they had seen.

Now, from the greatest of the Numbers mention'd, it is inferr'd, that in a full Drop of Water, there will be eight Millions two hundred and eighty thousand of these *Animalcula*; which, if their Smallness comes to be compared, a Grain of Sand broken into eight Millions of equal Parts, one of those Parts would not exceed the Bigness of one of those *Insects*.

These Observations of Mr. *Lewenboeck* were not only confirm'd by the famous Mr. *Hook*, but were likewise improv'd by him: He tells us, that after he had discover'd vast multitudes of those *Animalcula* described by Mr. *Lewenboeck*, he made use of other Lights and Glasses, and magnified them to a very considerable Bigness; and that among them he discovered many other Sorts much smaller than those he first saw, some of which were so very minute, that Millions of Millions of them might be contained in one Drop of Water.

This indeed might exceed the Belief of those who are not conversant with good *Microscopes*; but I am satisfied, whoever once understands their Use, and makes trial of those made in our own Country by the late Mr. *Mellen*, or those of Mr. *Wilson* and Mr. *Stirrup*, will not want any Argument to convince them of the Truth of what is here related.

If then it is true, that there are Creatures of that exquisite Smallness here mention'd, and that those Creatures have Life and Motion, as it is evident they have, what must we then think of their Muscles, and other Parts, as Mr. *Hook* observes? Certain it is (*says he*) that the Mechanism by which Nature performs the Muscular Motion, is exceeding small and curious; and to the Performance of every Muscular Motion in large *Animals*, there are not fewer distinct Parts concern'd, than many Millions of Millions, which are visible through a *Microscope*.

Mr. *Lewenboeck* has lately inform'd us, that upon a nice Examination of the *Ant*, he finds that it is not wanting of any Part which is judged to be necessary and conducive to the Life and Motion of the largest *Animals*; and he farther adds, that the Filaments or little Threads which compose those several Parts of the *Ant*, are as large as those which do the same Office in an *Ox*, or any Creature of the largest Size, somewhat like *Silk*, which, when it is first spun by the Worm, is all of one Fineness, but may be wove into the broadest Sattin, as well as serve to compose the narrowest Ribband; the one only taking a larger Quantity of those fine Parts than the other. And indeed, so far as I have observed, it is the same in *Plants*; the *Oak*, the *Gourd*, and the meanest *Moss*, are composed of Principles of the same Fineness.

This Account may suffice to shew us, that there are Beings subsisting, which are not commonly visible; and therefore it is easy to conceive, that the most gentle Air is capable of blowing them from place to place; and, through
their

their extraordinary Lightness, it is as readily inferr'd, that they may thus be convey'd by the Winds to us from the most remote Quarters of the World; but more especially from the *North-East* Parts, where the Cold is intense enough to give life to these small Creatures, and from whence there is not a Sea of a large Extent enough to destroy them while they are passing over it: For it is my Opinion, that the Vapour which naturally arises from the Sea, is much warmer than what generally is evaporated from the Earth, and consequently inconsistent with the Life of those minute Creatures; but chiefly those Vapours which rise from the main Sea, where the Land, or Fresh-waters are least prevailing: And therefore, were those *Insects* to be blown to us from the *North-West* Parts of *America*, I suppose the Length of the Sea they must then pass over, would kill them before they came to us; and perhaps is the reason why the Winds from thence are never known to blast any of our Trees, and are always much warmer than the *North-East* Winds, which come over a narrower Sea, which has many Rivers running into it. The *Orange-Tree* in such particular manner delights in the warm Air of the Sea, that in the Inland Parts of *Italy* they will perish by the Winter's Cold, if they are not housed; and yet several Degrees more *Northerly*, where they grow near the Sea, they flourish and defy the most rigorous Season. It is observable, that the main Sea of itself never freezeth, (as some say) not even under the *Poles*; but only in such Places where vast Rivers run into it, as in the *Sound*, and in *Hudson's-Bay*, where it is mix'd with Fresh-water, the Frost has power over it. It seems reasonable to believe also, that the Vapour which

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arise

ariseth from the Sea, is destructive to *Insects*; because we find how much the *Salt* taken from the Sea-waters contributes to the Preservation of Bodies from *Putrefaction*, which, I think, is always attended with *Insects*: And if the common Salt of the Sea-water is so great a Preservative against *Insects* and *Putrefaction*, I see then no reason why the Vapour arising from the same Fund of Water, should not partake of the same Virtue.

The Receipt to prevent *Wheat* from being smutty (which is a Blight common to Corn) seems to confirm what I have said; and I think we cannot enough commend Colonel *Plummer* of *Hertfordshire*, that so frankly communicated it, and so generously published it, for the common Good. Happy would it be for the Nation, if every one would so generously contribute towards its Welfare.

The Receipt teaches us, first to wash the *Wheat* through three or four several Waters, stirring it round each time with a large Stick backwards and forwards with great Force, and with a Skimmer each time take off all the light *Wheat*. When this is done, put your *Wheat* into a Liquor prepared in this manner:

Put into a large Tub, which hath a Tap, a sufficient Quantity of Water; then put as much Salt into it, as, when 'tis well stirr'd about, will make an Egg swim; then add as much more Salt as was before, and stir it very well; and to this put two or three Pounds of Allom beaten very fine, and stir it about.

This you are to use as you do your ordinary *Brines*, only you must let your *Wheat* steep thirty or forty Hours, for less signifies nothing; tho' the common Opinion is, that steeping so long kills

kills the *Seed* in the Wheat ; but Experience teaches the contrary.

You must take your Wheat out the Night before you sow it, and sift some slack'd *Lime* on it, which serves only to make it dry enough to sow. 'Tis necessary to add some more Water to the *Brine* in a Week or ten Days time, as it wastes, and Salt proportionable to the Water, and about a Pound of *Allom*.

Note, Many Farmers steep their Wheat in *Brine*, yet have plenty of smutty Wheat ; because they don't make their *Brine* strong enough, and take their Wheat out too soon.

Note also, Many Farmers have suffer'd greatly by smutty Wheat, especially in a dear Year, when such Wheat will not sell for above five or six Shillings a Bushel ; whereas that which is free from *Smut*, will sell for ten, eleven, or twelve Shillings ; and such smutty Wheat being eaten chiefly by the poorer People, and being unwholesome, occasions Sickness : Therefore for the Benefit of the Publick this is printed.

From hence we may learn how much Salt contributes to the Destruction of *Insects*, which occasion the *Smut* upon Corn ; and it is not unlikely, that such *Smut*, when it happens to be found upon Corn, may cause Sickness to such as eat of it : For I am very apt to believe, that the most epidemical Distempers Mankind is subject to, proceed from poisonous *Insects*, which are either eaten unregarded, or are sucked into the Stomach with the Breath ; as that worthy Gentleman Mr. *Balle* so curiously observes, in a Letter I have received from him, relating to infectious Distempers ; which I shall annex to this Chapter, as it contains many Observations which may

help to explain and confirm what I shall offer concerning *Blights*.

I have already taken notice, that every distinct Part of a *Plant* has its *Insect* which is naturally disposed to feed upon it, and those all different from one another, as well in Shape as in Colour: It seems reasonable enough also, that every *Insect*, as it has a different kind of Food, is of a different Virtue, perhaps partaking not only of the *Plants* they feed upon, but of the Qualities of each distinct Part of those *Plants* which are their Food: For, as I have observ'd, that every *Plant* has Channels peculiar to the Conveyance of its several Juices, such as those minute Pipes in the Wood, which admit only the rising Vapour from the Root; and those other larger Passages between the inner Bark and the Wood, by which that Vapour returns when it is condensed into a Water. And again, the different Sizes of those Vessels which make the *Parenchyma* of the several Barks, and respectively receive from the falling Sap such Parts only as they are distinctly made to imbibe, not to mention those other Vessels of different frame in the Leaves, Flowers, and Fruits of *Plants*, which can only admit of such Particles of Sap, as they are all separately appointed to receive: I say, from these Observations it appears that every Part of a *Plant* has then its distinct Virtue from the rest; and so the *Insects* feeding upon each respective Part, must then be of different Qualities from one another, and I conceive might be of greater Use in Medicine than the *Plants* themselves, if they were once try'd; as the *Cantharides*, which are *Insects* that, I think, feed upon the *Rose-Tree*; the *Alkermes*, which are bred upon the *Skrub-Ilex*; and the *Cochineal*, which is an *Insect* lately found

found in *Carolina*, to feed upon the *Indian Fig*, or *Prickly-Pear*; all which Creatures certainly contain the finest Spirits of the *Plants* they feed on.

I have often thought that it might be of some use, if such *Animals* as are commonly bred for the Food or Nourishment of Mankind, were sometimes fed with particular Diet, so as to alter the natural Virtue or Quality of their Flesh; and especially, if we were to practise upon such as are frequently used in Medicine. The *Thrushes* in *Italy*, which at one time of the Year feed upon *Myrtle-Berries*, have then the Flavour of *Myrtle* in their Flesh, and consequently some of its Virtue at the same time. So I doubt not but *Snails* (which differ so much from what I call *Insects*, that they will eat of almost any *Plant*) may be made to alter their Virtues, by feeding them upon some particular sort of *Plant* which we have a mind to extract any certain Virtue from; but this I leave to be better considered by those whose proper Business it is.

Insects infect *Plants* several ways, besides actually devouring them; as for example, the *Peach-Trees*, which so frequently have their Leaves curl'd up in the *Spring*, and are at that time cover'd with a kind of *Honey-Dew*, are then generally attended with great numbers of *Ants*, which resort to them; but it is not from the *Ants*, as is commonly imagined, that this shrivelling of the Leaves proceed; the *Ants* rather help the Tree than injure it; they come thither to feed upon certain little *Insects* which harbour on the back of the Leaves, wounding the *parenchymous* Parts of them, from whence they suck the Juices of the *Plant*; and by that frequent wound-

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ing, causes so many *Escars*, that the Leaves cannot avoid curling and becoming gummy. The *Insects* I mention may be easily discern'd without Glasses; but being magnified with a common *Microscope*, appear as large as the third *Figure* of the first *Plate*. *Plum-trees* are sometimes distemper'd in the same manner with *Insects*, somewhat like those upon the Leaves of the *Peach-tree*, and the Bark of the tender Shoots of both those Trees is frequently pinched by other small *Insects*; one of which I have cut out of it, and magnified, as in the fourth *Figure*, *Plate* I. Its Back was covered with Bristles, which grew the contrary way to those commonly found in the other Animals. Besides these, some *Peach-trees*, and the *Almond-tree*, have their Leaves frequently blister'd and turn'd red, without any Appearance of *Insects*; but if we examine them with a good *Microscope*, we may easily perceive the *Parenchyma* of them to be fill'd with little white Worms; which, according to the Nature of other *Insects*, would in time come to have Wings. These *Insects*, thus invading the young Shoots, will certainly destroy the Trees, if they are not carefully pruned off as soon as they appear; as I constantly do whenever I see them: And I am informed from a Person of Honour, that to prevent the Insults of these, or any other *Insects*, he has known it practis'd to bore a Hole with a small Gimlet, sloping downwards through the *Bark*, so as to reach the Wood of the Tree; and pouring into it some *Quick-silver*, about half an Ounce, or more, according to the Bigness of the Tree, and stopping it up, the *Insects* then harbouring upon it will infallibly be destroyed: But if the *Mercury* reach the *Pith*, the Tree will be endanger'd: And I cannot chuse but be of his
Opinion,

Opinion, altho' I have not made the Experiment; because I have been witness of the Effect that *Crude Mercury* has upon *Worms* in human Bodies; which answers to what my Author has said of its Operation upon the like kind of Creatures in Trees: And if then, by putting *Mercury* in one Part of a Tree, the whole is so affected by it, as to destroy the *Insects* feeding even upon its most remote Parts, I think there will be no occasion to dispute the Circulation of *Sap* in *Plants*: But the *Insects* which prey upon the Juices of the *Oak*, and have their proper Matrices, or Beds for hatching in, upon the several Parts of that Tree; yet produce other Effects than what I have hitherto mentioned. The *Oak-berries*, which we find in *May* and *June* upon the *Leaves*, and sometimes upon the Strings of *Male-blossoms* or *Catkins*, are occasion'd by a kind of *Fly*, not much unlike a *Flying-Ant*, which bites the most spongy or parenchymous Part of the *Leaf*, or the tender Part of the *Catkins*, and lays its Egg in the Wound; which, perhaps, by virtue of some Juice which the *Insect* leaves at the same time, inclines the wounded Parts of the Tree to grow over the Egg, so as to enclose it entirely, and make it swell till it is hatch'd, and grown big and strong enough to eat its way out. I have seen of these *Oak-berries* as big as large *Peas*; and when they are at their full growth, are sometimes, if they be exposed to the *Sun*, of a brownish red Colour.

There is another kind of *Insect*, which attacks the more rough Part; such as the Bark that encloses the Bole near the Root of the *Oak*: The Eggs of this are shut up in a kind of Berry, somewhat less than the former, but of a most beautiful red Colour. They are commonly to be found

found in *May*, as I have observed in many Places in *Richmond-Park*. Besides these, the *Oak-apples* proceed from other Wounds made by *Insects* of a different kind, in the Bark of the tender Twigs, in which they lay many Eggs, that turn afterwards to *Worms*, as I have often seen. These, which they call *Apples*, no more than the *Oak-berries*, are Fruits naturally design'd by Nature for the Tree; but in the manner I relate, are produced by accident, where the several *Insects* happen to light.

It would be tiresome to relate all the several ways that *Plants* are attack'd by *Insects*; and indeed would be needless to do it, if I was capable; seeing that so far as we yet know concerning these things, two or three general Remedies put in use against those Creatures, will suffice to hinder them from making any considerable Progress. The *Matrasses* of *Straw*, which I have already mention'd, are good Guards against the *Easterly* Winds to shelter *Wall-fruit*; and a good Fence of *Timber-trees* to the *East* of our *Orchard*, will contribute to preserve our *Standards* from the *Caterpillers*; which, if they should happen to come, may be destroy'd by the *Smoke* of wet *Straw* or *Weeds*. And in case our *Peach-trees*, and such-like kinds of Fruit, should be unfortunate enough to be invaded by those small *Insects* I have described, the Pruning off those Leaves or Twigs, as I have already hinted, is a sure way to free us from them; as I doubt not would be the Use of *Quick-silver*, as I have directed. In the Time of the great *Plague* in *London*, it was propos'd to have large quantities of *Onions* expos'd in Boats upon the *Thames*, which were to have been continually bruised, chopped, and moved about; which it was imagin'd would

would abate the Infection, supposing the *Plague* to proceed from innumerable Armies of minute unwholsome *Insects*, which were then floating in the Air, and drawn in with the Breath: If this Proposal could have had the desired Effect, then I think we might, by the same Rule, destroy the *Insects* upon Trees, by washing the Leaves with Water wherein *Onions* had been bruised and steep'd, or by laying some bruised *Onions* under our Trees that are the most assaulted by *Insects*.

There remains yet one thing relating to *Insects*, and their manner of infecting of *Plants*, which is so curious, and I believe so little known, that I cannot well avoid mentioning it; and that is, concerning the *Folium-ambulans*, or *Walking-leaf*: Two Kinds of it I have delineated, *Fig. IV.* and *V.* in the First *Plate*, from the *Insects* themselves, in the Cabinets of the excellently learned Sir *Hans Sloane*, Barr. of the late indefatigable and curious Naturalist, Mr. *James Petiver*, and in those celebrated Collections of Curiosity in *Holland*, belonging to the famous Mr. *Vincent* of *Harlem*, and Dr. *Frederic Ruysb* of *Amsterdam*; all these Gentlemen are shining Ornaments of our *Royal Society*.

Both the wonderful *Insects* I mention, are brought us from *Amboyna*, where there are many different Species of them, and, as I am inform'd, are produced in the following manner: The *Insect*, when it has found its proper Tree of Nourishment, lays its Eggs separately in the Buds of it, which hatch when the Buds begin to shoot; the *Insect* then is nourished by the Juices of the Tree, and grows together with the Leaves, till all its Body is perfected; and at the Fall of the Leaf, drops from the Tree with
the

the Leaves growing to its Body like Wings, and then walks about; this is not common enough with us to be easily believed, and what I should not have ventured to mention in this place, if the *Insects* themselves were not to be met with in the curious Cabinets of our own Country.

What I account the most curious Point belonging to this Relation, is, That the *Sap* of any Tree should be so naturally adapted to maintain at once both *Vegetable* and *Animal* Life; and by that means to unite the Parts of two Beings, so distinct from one another, as *Plants* and *Animals*, and circulate the same Juices equally in the Vessels of both. Indeed we have Instances enough to shew us how necessary the Juices of *Plants* are to the breeding up of some *Insects*; and even to confirm that some kinds of *Insects* cannot be brought to live, without their Eggs are properly lodg'd in, and entirely envelop'd with some certain Parts of *Plants*; as those *Insects*, for example, which Nature has allotted for the Leaves of the *Oak*, and which make the *Oak-berries*; but that a *Leaf* of a *Plant* should so unite itself with an *Insect*, as to make one distinct living Body, is wonderful.

The curious Mr. *Vincent*, above-mention'd, once shew'd me the Picture of a Branch of the Tree which the *Insect*, *Fig. IV.* grew upon; in which was painted these strange Creatures of several Sizes, adhering to the Tree in the manner I have related. The Head and small Parts of the Legs were of a light-brown Colour; and the Wings and other Parts were of the Colour of the common *Bay-leaf*; which Colours the *Insect* retains, even after it has been dead several Years.

The

The other of this kind, *Fig. V.* has Wings, of the figure and size of the Leaves of the *Spanish Broad-leav'd Myrtle*; but all its Parts, when I saw it, were of a *Feuilemort* Colour.

Now, as every *Plant* growing upon the Land is subject to be infected by *Insects*, so the *Plants* of the Waters are also annoy'd by living Creatures that prey upon them. All sorts of *Gnats* lay their Eggs upon the Waters; and so soon as they are hatch'd, and possess that degree of Life answerable to *Caterpillars*, we see them frisking about in the Water for a time, commonly making their Motions in the figure of an S. These *Nymphæ*, like *Land-Insects*, lay themselves up at their appointed Time, and from that State resuscitate and fly away in Groops. These Kinds are bred in stagnated Water, about *July*. The *Boat-Flies*, as they call them, and several Kinds of *Water-Insects*, all have their respective Plants to feed on, and breed upon them (so far as I yet find) somewhat after the manner of *Land-Insects*: It would take too much time to relate the several Particularities found in some of them, contrary to other living Creatures, or to describe their several various Forms, which would be of little use to my present Purpose; I shall therefore now submit these Observations concerning *Blights*, to the Censure of my Reader, and conclude with that curious Letter relating to *Plagues*, and other epidemical Distempers.



To Mr. BRADLEY, &c.

S I R,

UPON discoursing with you some time since about *Blights* upon *Trees*, you seem'd to be of opinion that they were the Effect of *Insects* brought in vast Armies by the *Easterly* Winds, and by lodging upon the *Plants* proper for their *Nourishment*, they there produced that *Distemper* which is call'd a *Blight* or *Blast*.

You was then desirous of what Observations I had made concerning *pestilential Distempers* subject to Mankind, which I believed to proceed from the same Cause that produced *Blights*, i. e. from *Insects*; I have therefore, in answer to your Request, endeavour'd to recollect what I have from time to time observed relating to that Case.

To pretend to give a natural Reason for *Plagues* or *Pestilences* that happen in the World, may be thought by some to enter too far into the Secrets of the *Almighty*. *Plagues*, as commonly argued, proceeding from, or being the immediate *Finger* of *God*, without the Concurrence of *Nature*; that they are sent down from him immediately for the Punishment of sinful Nations, as in several Cases mentioned in *Holy-Writ*; and doubtless such Judgments on Criminals must have often been, and may yet be to the End of the World.

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But however, the All-wise God, it may be said, seldom in any thing acts contrary to those Laws of Nature which he has instituted; rarely working by Violence, what may be done by natural Means: So that in this case, setting aside Miracles, and what the Almighty can do, if he pleaseth, by his own Power, my Endeavours will be to find out by what natural Means Providence may work to bring that terrible Judgment of Plague or Pestilence upon any Country.

It is the common received Opinion, that the Plague proceeds from an Infection in the Air; and so undoubtedly it does: But then it will be asked, Why the Air is not at all times thus infected?

Some will have it, from Steams or Vapours arising from some poisonous Minerals at certain bad Seasons; which being by us taken into our Bodies with the Air, ferments and corrupts the Humours of the Blood, and our most delicate Parts, and at length extinguisheth that vital Fire in which our Life consists.

But this can hardly be the true Cause; since few Minerals have such mortal Steams constantly issuing from them, but at some times only; unless it be in the Grotto del Cane, at Baia near Naples, and some other Places of the like kind.

This Grotto is a Hole dug into a Bank near the Lake d'Averno, whose Water is warm, continually bubbling or boiling up: This Lake is cover'd with a green Scum, and never freezes, lying not far from the famous Sulfo Terra, where much Brimstone is made, and where Smoke issues out of the Ground in many Places. The Entrance of the Grotto is hardly wider than a common Door, and not high enough to admit a tall Man without stooping, growing narrower towards a Point,

PART III.

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a few Yards distant from the Mouth: At the Bottom 'tis very wet, almost standing Water, with Stones lying in it; and the Sides are also moist about a Foot or two in a strait Line above the Bottom, which is as high as the *Steam* rises, and is known by putting in a lighted Torch into the *Grotto*, and lowering it by degrees, till the Flame comes below the Top of the *Steam*, and then goes out. The Torch thus extinguish'd, the *Smoak* which is then below the *Steam*, cannot rise above it, but slowly steals out of the Mouth of the *Grotto*; and then ascending, is dispersed. Nothing will burn in this *Steam*, nor any Creature either of the Land or Water live in it longer than it can hold its Breath; not even an *Insect*, as I have experienced.

I ventured to put my Mouth below the Surface of this suffocating *Steam*, and sucking in a little of it, I found it of a very strong Scent, somewhat like *Sal Armoniac*. It seem'd to me, after two or three Trials, that it was the most like Sucking for Breath in a *Vacuum*; it wanted that Substance which we find in common Air, and is so necessary to maintain Life in any Creature.

The common Trial shewn to Strangers, is to tie the Legs of a Dog, and lay him on the Ground where this *Steam* rises; he immediately falls into *Convulsions*, sets his Eyes, and struggles in the same manner as I have seen Creatures do in the *Air Pump*, when the Air is exhausted. The Dog, when he is void of motion, is quickly drawn out of the *Grotto*, some few Paces to the Side of the *Lake*, and his Nose and Mouth thrust in and rubb'd in the Mud and Water, by which means he soon begins to recover, and in a little time is so well, that he returns home with his Master.

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The Man who shewed us the *Grotto*, when he saw that I was going to put my Head into the *Steam*, protested against it; and when he could not prevail, went away: But I told him, if I suffer'd as the Dog had done, he should make use of the same Remedy, and recover me in like manner. But I soon satisfy'd my Curiosity, without receiving any Harm.

Somewhat like this, is what I suppose are call'd *Damps* in *Mines*, in *Britain* and other Places; which come only at times, and are not lasting: These *Damps*, when they rise, will not suffer any Light to burn, and soon suffocate the Workmen, and kill them, if they are not presently drawn up into the open Air. No other Means has yet been discover'd to recover them after such Accidents, excepting a fresh *Turf* be cut, and laid to their Mouths; which perhaps may be for the same reason that the Mud being apply'd to the Nose of the Dog, recovers him after he is drawn out of the *Grotto*.

Upon the Town-Walls of *Leghorn*, and in other Places of *Tuscany*, they have Holes made like large *Ovens* for the Preservation of *Corn*. These *Conservatories* are brick'd within-side, and coil'd round with *Wisps* or *Cables* of *Straw*: On their Tops, which are level with the Surface of the Earth, are placed large Stones, with a Hole cut in each of them, big enough to admit Men and Baskets to go down. These Places, when they are fill'd with *Corn*, are closely stopp'd with Stone-covers, and Earth flung over them; but hither, such *Corn* only is brought, as is infested with *Weevels* or *Ferments*, beyond the Cure of turning them; when, by the help of this Method, all living Creatures in it are destroy'd, and the most violent *Ferment* it can be subject to, is

stopp'd, the *Corn* is taken out, and return'd to the *Magazines*. In *Sicily*, *Barbary*, and I think in all other hot Countries, this is the only way made use of to preserve their *Corn* from spoiling by these Accidents; which it is never safe from, after it is thrash'd, till it is used: And I suppose these *Conservatories* would have the same Effect upon all other Seeds or Grain.

'Tis remarkable, that in and about *Genoa*, where vast quantities of *Corn* are laid up, they have none of those Places for curing their distemper'd *Corn*, but are often constrained to send it to *Pisa*, to be thus brought to itself, there being no Earth near *Genoa* that will produce that Effect.

In my Time, one of these *Conservatories* being empty, was left open, where some *Frenchmen* were playing at *Bowls*; and one of the *Bowls* falling into it, one of the Company was let down with Ropes to fetch it up, but he was no sooner down but he was suffocated to death; and one of his Companions, who endeavoured to get him out, was so sensibly touch'd with the noisome Vapour of the Place, that before he could get half way, he was forced to return: But this was accidental, and I suppose was somewhat like the *Damps* in *Mines*, which I have already taken notice of.

The poisonous *Vapours* I have here mention'd, are plainly more destructive to Animal Life, than any others that have been known; in that they act much quicker upon the Spirits of Animal Bodies, than those which are said to occasion the *Plague* or other pestilential Distempers: And there is this difference likewise between them, that a Body poison'd by the first, will not communicate that Poison to another, as People infected by that
Vapour

Vapour which causeth the *Plague* are known to do; therefore I think it is plain, that the most nauseous *Vapour* of itself will not cause any *Distemper* that is *epidemical*.

It seems then, that the *Plague* proceeds from some other Cause; and that I suppose to be *Insects*, of that extraordinary Smallness, that they are not to be discerned by the naked Eyes; they are so light, that they float in the *Air*, and so are suck'd in with the Breath. Such *Insects* not being among us commonly, but only when they are either brought to us from some remote Place by the *Wind*, or hatch'd or nourish'd by some Intemperance of *Air*, or from poisonous *Vapours* arising from *Bogs*, *Ponds*, *Ditch*es, or some such unwholesome Funds of stagnating Water.

These *Insects* are various, according to the Nature of the Water or Air they are bred in; their Eggs being first laid by some flying Animals, which are then hatch'd; and passing thro' the several Changes common to *Insects*, at length take wing; and being drawn in with the Breath, may perhaps be either kill'd in our Bodies, and cause a violent Ferment in the *Juices*; or else finding proper Nourishment, they breed in the *Lungs*, *Stomach*, or other Parts within us, and probably may occasion those Biles and Breakings out in the tender Parts of the Body, that are called *Plague-sores*.

But these *Insects* are some of them so extremely small, that they are only capable of being discern'd with good *Microscopes*; and when they are wing'd, and so quite perfected, may perhaps in Swarms be carried from one Country to another by the Wind. It is *Insects* of several Kinds and Colour, which cause the Surface of Waters to

appear sometimes *green*, *red*, or *black*; which last Colour in Water, is observ'd by the Herdsmen to poison the Cattle that drink of it; and they say, causeth the *Murrain*, which is the *Plague* in Cattle, and is very infectious.

It has been observed, that *Plagues*, and the most contagious Distempers, have commonly happen'd in those Years, when the *Easterly Winds* have more than ordinarily prevailed in the *Spring* and *Summer* Seasons; then the Air comes to be infected, and rarely or never at other times. These Winds we see bring *Caterpillars*, and many different *Insects* and *Flies*, which meeting with Places fitly adapted to nourish them, they are there brought to their wing'd State; which I conceive is the same in the invisible Animals as in the visible; nor indeed is any Part of the Earth or Waters, and it may be, the pure Air itself, free from the *Seeds* of Life: Nothing is out of Motion, or can be void of it, setting forth the Glory, and infinite Power, and Wisdom, of the *Creator*; from whence these infinite Productions proceed, some for one Use, some for another. What we call the bad, are those, which at unseasonable Times invade by Swarms the Bodies of living Creatures, to whom they are destructive, and cause the *Murrain*, *Rot*, and such-like mortal Diseases.

Again, that the *Plague* proceeds from living Creatures brought by the *Easterly Winds*, seems probable; for that such *Pestilences* are most malignant in the *Summer*, after the *East Winds* of the *Spring* have blown; which passing over the greatest Continent of the Earth, bring these *Insects* with it: But the contrary Effect have the *West Winds*, which come to us over the vast *Atlantick Ocean*, attended with great Rains. These
last

last *Winds* cure the *Plague* (it may be) by carrying back the Remainder of those *pestiferous Insects* which yet survive, to the Country from whence they came; And *Frost* and *Snow* likewise stop the Infection, perhaps by killing them, or laying them to sleep till the next Season, when they may be either brought back again by the *Easterly Winds*, or be enliven'd, or fresh Swarms hatch'd by the Temperature of Air suitable to them.

I have not yet found that any *Winds*, except the *East Winds*, such as pass over *Tartary*, bring any Infection with them; nor have I ever heard of *pestilential Distempers*, in any Part of the World, unless in such Places only where the *Tartarian Winds* reach; *Tartary* being a Country full of *Woods*, *Bogs*, and *Fens*, it seems the most capable of producing those Creatures in abundance, which may be carry'd by the *Wind* to certain Places in search after their Food, as are *Locusts*, and some certain *Birds*, which are known to pass from one Country to another.

Diodorus Siculus, in his Historical Library, Book XII. p. 286. saith, "The *Plague* broke out afresh at *Athens*, when they had been but lately freed from that *Contagion*: It raged with that Violence, that they lost four thousand Foot-Soldiers, and four hundred Horse, and of others, Freemen and Servants, above ten thousand. And now, because the Course of the History may require a Declaration of the Causes of this violent *Distemper*; it is necessary in this place to set them forth:

"Abundance of Rain had fallen in the *Winter*, by reason whereof the Earth being over-wet, (especially in low and hollow Grounds) the Water lay in the standing Pools, which

“ corrupting and putrifying by the Heat of the
 “ *Summer*, thence proceeded a Mist of gross
 “ stinking *Vapour* which corrupted the *Air*; and
 “ besides, the Want of good Food much advanced the Progress of the Disease; for the Year
 “ before, the *Fruits*, by too much Rain, were
 “ crude and unwholesome.

“ There was likewise a third Cause of this
 “ *Distemper*, which was this: The *Etesian Winds*
 “ (*which I take to be the Maistrali, or North-*
 “ *West Winds*) blew not this *Summer*, by whose
 “ gentle Breezes, the violent Heat of the *Air* was
 “ used to be allay'd at other times; so that the
 “ Heat being now more excessive, and the *Air* as
 “ it were inflamed, Men's Bodies wanting the
 “ usual Refreshment, contracted an evil Habit,
 “ from whence arose *burning Distempers*; and
 “ thence it was that many seized with this Disease,
 “ cast themselves into *Pits and Wells*.”

I was not in *England* in 1666, when the *Plague* raged in *London*; but I have heard from some of those that were then in the City, that the *Summer* was so dry, that hardly any Rains fell until *November*; which Drought must be occasion'd by an unusual Frequency of *Easterly Winds*.

Experience shews us how much *Insects* delight in stinking Places, and that they increase much faster in uncleanly Cities, such as *London* was formerly, than in cleaner Places: But the City of *London* having been for the most part burnt the Year after the *Pestilence*, its Streets were enlarged, many Drains were made; and good Laws were put in execution for keeping the City clean; and it has not had any *Plague* ever since.

It is remarkable, that when the *Plague* reigned in *London*, *Bucklers-Bury*, which stood in the very Heart of the City, was free from that *Distemper*: The Reason given for it is, that it was chiefly inhabited by *Druggists* and *Apothecaries*, the Scent of whose *Drugs* kept away the *Infection*; which, according to my Notion, were so unnatural to the pestilential *Insects*, that they were kill'd or driven away by the strong Smell of some sort of *Drugs*. The Smell of *Rue*, and the Smoke of *Tobacco*, were prescribed as Remedies against the *Infection*; but especially *Tar* and *Pitch Brrrels*: And I have been informed by a Person of Credit, that the People of *Lime-House* were not affected by it, nor some of the *Docks*, perhaps for the same Reason. So also the Use of *Sea-coal* may now be one Means to prevent the *Plague* in *London*.

The People of *Leghorn* observe, that at the End of every Eighteen Years they are subject to an *epidemical Distemper*, which, if it be not the *Plague*, is hardly to be distinguished from it. I was there in two of those Years; the second was in the Year 1685, and was much worse than the first: It began about the Beginning of *Summer*, with frequent *Easterly Winds*, (such as are not usual) continuing to blow almost without Intermission till towards *Winter*; much as *Diodorus Siculus* describes the Year to have been when the great *Plague* was at *Albens*: We wanted that *Summer* our *Maisrali* or *North-West Winds* as we used to have; which are the *Trade-Winds* in all the hot Countries of the World, following the Course of the *Sun*. About Nine or Ten in the Morning, these Winds begin to blow, and last till Sun-set; when soon follow the Winds from the Shore, which blow till the next Day about Nine; and then the *Trade-Wind* retakes its Course.

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The first *Infection* began in Houses near the Walls of the Town to the Landward, from whence the *East Wind* blew, and by degrees crept towards the Sea; but the *Infection* did not touch such Places, which were inhabited by *Merchants* and *Shop-keepers*, who dealt in *Salt* and *pickled Fish*, *Pitch*, *Tar*, and such-like Commodities.

To the *Northward* of the Town, towards the Sea-Shore, lay very boggy, stinking Ground. These *Marshes* commonly about *Autumn* cause *Agues* and *Fevers*; which may be from vast Swarms of invisible unwholsome *Insects* which rise from thence at that Season, but of a different *Poison* from those which cause the *Plague*. So the like Places about *Civita-Vecchia*, *Scanderoon*, and I may mention the Isle of *Sheppy* likewise, seem to cause *Agues*. And it is observable, that from the Mouth of the River *Magra*, which divides *Tuscany* from *Liguria*, along the Sea-Coast of *Italy*, as far as *Terracina*, is very unhealthy, and subject to *Agues* and *pestilential Fevers*, being *marshy Ground*.

We may also observe, that in *Turky*, *Egypt*, and *Barbary*, when the *Plague* rages, the *Franks*, the *English*, &c. are seldom infected with it; which seems to confirm my Opinion, that this Sickness proceeds from *Insects*, who having their certain natural Nourishments respectively appointed them, do not in those Places infect Strangers, who have different ways of eating and living from the Natives, and are of a contrary Nature of Body. It would be well worth Enquiry, if the People of those Nations, that were in strange Countries in the Times of *Pestilence*, were also free from *Infection*.

King Charles II. when he was told of the Sickness at *Leghorn*, said it must have been occasioned by the *new Fortifications* which were then building in

in those "marshy Places. And it is very rational to believe, that turning up those unwholsome *Muds*, and exposing them to the *Sun*, did much increase the *Distemper*, by infecting the *Air*, and filling it with greater Supplies of poisonous *Insects*.

I cannot help taking notice likewise of the raging *Distemper* which was among the *Cows* about *London* sixteen or eighteen Years ago: It was so violent and infectious, that if *one* had it, all others that came within scent of her, or even eat where she grazed, was surely infected: It seized their *Heads*, and was attended with Running at the *Nose*, and a very nauseous *Breath*, which killed them in three or four Days. The *Herdsmen* would not allow it to be the *Murrain*, nor could give any Account from whence it did proceed, or could find out any Remedy against it: They only tell us, the unusual dry *Summer*, and the continued *East Winds*, were the occasion of it. This *Distemper* had been for two or three Years before it came to us in *Lombardy*, *Holland*, and *Hamburg*, to the Loss almost of all their *Cattle*. The *States of Holland* caused a *Medicine* to be published for the Good of those who had their *Cattle* thus distemper'd; but having been try'd here, 'twould not cure one in seven, but rather increased the *Infection*, by keeping the distemper'd *Cattle* longer alive (by some Days) than they would have been without it. 'Tis remarkable, that no *Oxen* had this *Distemper*, but only *Milch Cows*, which were more tender than the *Males*. The *Herdsmen*, to keep their *Cattle* from the *Infection*, let them bleed in the *Tail*, and rubb'd their *Noses* and *Chops* with *Tar*; and when any happen'd to die of it, they were burnt, and buried deep under *Ground*. It began at *Islington*, spreading itself over many Places in *Middlesex* and in *Essex*; but did

did not reach so far *Westward* from *London* as twenty Miles.

The most general Opinion concerning the Cause of this *Distemper*, was, that the *Cattle* were first infected by drinking some unwholsome standing Water, where 'tis probable some poisonous *Insects* were lodged and bred; the *Summer* having been extremely dry, attended almost constantly with *Easterly Winds*, the Grass almost burnt up, and the Herbs of the Gardens almost destroy'd by *Insects*; but such as they were, (unfit for Table-use) were given to the *Cattle*. There was likewise so great want of *Water*, that many were forced to drive their *Cows* five or six Miles to it.

The *Elektuary*, publish'd upon this Occasion by the *States of Holland*, was composed of most, if not all the *Drugs*, used in the most serviceable *Medicines* that were made use of against the *Plague* among Men; most of which Ingredients we know to be mortal to *Insects*, as strong-scented Roots and Herbs; but above all, *Aromatick Gums* and *Saps* of *Plants*, as *Rue*, *Garlick*, *Pitch*, *Tar*, *Frankincense*, and *Olibanum*; but I believe, before all others, Extractions from the *Cedar*, nothing preserving Bodies from Worms better than that. These Ingredients are much used in *France* and *Italy*, to prevent or destroy Infection, by burning them, and smoaking such Bodies, Letters, or any other Things as are brought from infected Places, after they have made *Quarentine*, and are not suffered to come on Shore till they have undergone this Operation.

It is not against Experience, that *Insects* can live and increase in Animal Bodies: How often do we find Men, Women, and Children troubled

bled with *Worms*? What Varieties of those *Insects* are often voided by them? And how should that be, if they were not either suck'd into the Stomach with the Breath, or taken into it with some unwholesome Food? For they cannot breed in such Bodies from nothing, without either their Eggs, or themselves are brought thither by some Accident. For if they were the natural Produce of Animal Bodies, they would then be alike common to all, which we know they are not.

I have been inform'd, that in the Year 1714, when this *Mortality* among the *Cows* was at its height, that towards the End of the *Summer*, some Farmers bought in fresh Cattle, and turning them into the same Fields where many *Cows* had died before, they took the Infection, and died likewise: But the following Spring those Fields were void of Infection, and the *Cows* that were put into them did very well; but what were then put into the *Cow-Houses*, where the sick *Cows* had been the Year before, were seized with the *Distemper*, and died; which seems to inform us, that it was the Effect of *Insects*, which thro' the Warmth of those Stalls were preserved from the Severity of the *Winter's Frost*; but such as were left in the open Fields were destroyed by the Cold. I have heard that a Woman about *Camberwell* cured six in seven of her *Cows*, by giving them once a Week an Infusion of *Rue* and *Ale-wort*.

But it may be asked, Why these *infectious Distempers*, subject to *Men*, *Cattle*, and *Plants*, are not universal? And why the *Plague* should not be as well in *India*, *China*, the South Parts of *Africa* and *America*, as in these Parts of the World? (For I do not find that it has ever been in those

those Places.) This Query gives me a farther Opportunity to suggest that *Insects* are the Cause of it, and that they are brought with the *Easterly Winds*. In the first place, so far as I can learn, there is not naturally in *America* any one kind of *Creature* or *Insect* that is found in any other Part of the World, and the *Plants* likewise are all different from those of other Countries; as it is the same in *India*, *China*, &c. whose Products are quite different from what we find elsewhere. Supposing then that these pestiferous *Insects* are only the Produce of *Tartary*, let us consider to what Parts of the World they may be carried from thence with the *Easterly Winds*; and whether *India*, *China*, the South of *Africa* and *America*, are not beyond their reach, or can reasonably be affected by them.

Whoever considers the Disposition of the Land and Water in the Globe, may thus account for the Passage of these *Insects* with an *Easterly Wind* from *Tartary*, to all the Parts of *Europe*, *Asia-Minor*, *Palestine*, *Barbary*, and other South Coasts of the *Mediterranean Sea*, whither, 'tis highly probable they may come, without meeting any thing in their Way to obstruct their Course.

The best Maps do not lay down any *Mountains* of Note between *Tartary* and the Places which have been subject to the *Plague*. The *Alps* run parallel with the Winds coming from *Tartary*, and therefore do not any way hinder their Passage: The *Mountains* of *Dalmatia* are not high enough to prevent the Passage; or if they were, the *Caspian Sea* is sufficiently large to let them pass to the South Parts of *Europe*, the *Mediterranean Sea*, and the North Coasts of *Africa* even to their most Western Bounds.

Now

Now it may be expected perhaps by some, that these Winds should yet continue their Progress as far as *America*; but, as yet, so far as I can learn, these *Land-Winds*, when they have blown with the greatest force, and have been of the longest continuance, have not reach'd farther than about three hundred Leagues beyond the *Western Coasts* of *Europe*, which is a Trifle in comparison of the vast *Ocean* between *Us* and *America*. Besides, it is my Opinion, that the Winds which blow over so vast a Tract of Land, as these *Tartarian* Winds must do, that I suppose convey and support the pestiferous *Insects*, are of so different a Nature from the *Winds* coming from the *Ocean*, that 'tis likely those Creatures which would subsist in the one, would be destroy'd by the other: So that if I am right in this Conjecture, *America* cannot be subject to the *Plague*.

Mount Atlas, which is a vast Ridge of *Mountains* running from the *Ocean* almost as far as *Egypt*, and are back'd with the Desarts of *Lybia*, may very likely obstruct the Passage of these *Insects* to the *South* of *Africa*; and for that reason, perhaps, secure that Part of the World from *Plagues*. So likewise *Mount Caucasus*, or *Ararat*, which is one of the highest Ridge of *Mountains* in the World, running from *East* to *West* through *Persia* and *India*, may secure the *South* Parts of those Countries from the *Plague*, by stopping the Passage of those infectious Creatures, if any Winds from *Tartary* should happen to blow them that way: And as *China* lies to the *East* of *Tartary*, so it must be *Westerly Winds* which must infect that Country with the *Plague*, if it proceeds from what I imagine: But we do not yet find that *Westerly Winds* are frequent in those Parts; or if they are, we may be assured they cannot blow
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at the same time when the *Insects* are hatch'd and carry'd the contrary way by the *Wind* from *Tartary*. We are inform'd, that upon the Coast of *China* the Winds are so regular, that from *October* to *March* they continually blow from the *North-East*; and from that Month to *October*, the direct contrary way.

I have now given you what Observations I have made concerning pestilential *Distempers*; which I think may, in some measure, serve to confirm your Notion of *Blights*.

I am, Yours, &c.

The End of the Third Part.



OF



OF THE
Kitchen-Garden.

PART IV.

CHAP. I.

Of the HOT-BED.



Hot-Bed is the common Help made Use of by *Gardeners* to forward the Growth of a *Plant*, and force Vegetation, when the Season of itself is not warm enough. By this Means (if it be managed with Skill) the hottest Climate of the World may be so nearly imitated, that Seeds of *Plants* brought from any Country between the *Tropicks*, may be made to flourish: In a word, it is both curious and useful.

PART IV.

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In order therefore to have a right Understanding of the *Hot-Bed*, let us consider what degree of Heat is required for the Growth of *Plants* we are to raise upon it; for Nature must be imitated as near as possible, and not forced or exceeded, if we hope for Success in our Undertaking.

Heat and *Moisture* are certainly the Rudiments of Vegetation; and therefore whoever would promote the Growth of a *Plant*, must contrive how to have them both in such due Proportion, as that neither one or the other exceeds those Limits which Nature has allotted for the Growth of *Plants*. A dry *Heat* we find rather scorches and shrinks a *Plant*, than makes it grow; and *Wet*, if it is not quickly exhaled from the Root of a *Plant*, chills it, and often injures it past Recovery. A moderate sweating *Heat* therefore is the most desirable, such as is raised by the Ferment of wet *Straw* or *Horse-Litter*, which for a time will send forth from the Earth, lying upon it, that gentle *Steam*, which we find contributes so much to the Growth of many *Plants*, besides the putting those Juices into Motion which are lodged in the Root, and circulating them through the *Vessels* of the *Plant*.

The *Steam*, which I suppose to rise from the *Root* into the *Wood Vessels* of *Plants* to furnish them with *Sap*, Chap. I. Part I. of this Work, will indeed of itself keep a *Plant* alive; but then, at the same time, the *Bark*, *Leaves*, and other *spungy Parts* of a *Plant*, (which encompasses the *Sap-Vessels*) if they are over-dry, will shrink and pinch those *Vessels* so very close, that they cannot admit the *Sap* to circulate through them in such Quantity as is necessary to support the *Plant* in Vigour; on the contrary, when the *parenchymous* or *spungy Parts*

Parts of Plants are kept moist by the *ascending Vapours*, or the Air which continually flows round about them, then the *Sap-Vessels* are also more open, and at Liberty to receive the Nourishment rising from the Roots.

To explain this, let us consider those *Plants* which are cultivated in Pots, and set singly in Chambers, and other Places of the House for Ornament in the *Summer*; though we allow them large *Pots*, fresh *Earth*, and *Water* enough, and *Air* as much as they have in a *Green-house*, how sensibly do they decline in a few Days, which happens only for want of that *Steam* which is always abroad, (more or less) rising from the Earth in the Day, and condensing and falling upon them again at Night.

Nor can the *Pots*, set singly in a Chamber, have this Help as those have which are set together for Shelter in the *Winter* in a *Green-House*; the Number of *Pots* in a Collection of *Plants*, affording *Steam* enough to nourish one another, which one single *Pot* must want.

The like is to be observed in a dry Season, when we are forced to water *Plants* that stand abroad; they are by that Help but just kept alive, because the Earth round about them is so dry, that it hardly emits any *Steam*, or at least not enough to support them; but when Rain has fallen, we find a contrary Effect: The Vapour then rises from the Earth every where about the *Plants*, and makes them flourish: So that I prefer the floating of Grounds, for the Welfare of many Kinds of *Plants*, before simple Waterings; but there are some particular Sorts which it would destroy, as I shall explain elsewhere.

A *Hot-Bed* then appears to be of Use as long only as it can send out such *Vapour* from the

Earth lying upon it, as is necessary for the Support of the *Plants*; and when it wants the *Heat* which is required for that Purpose, it must be renewed; for else the Moisture, which must be maintained to nourish the Roots of the *Plants* growing in it, will chill and destroy them. I would not be supposed here to mean the *Steam* which arises from the *Dung* itself, for that is known to be destructive to all *Plants*; it is the *Vapour* only which the *Heat* of the *Dung* evaporates from the Earth lying upon it, which will help the *Plants*, and that too must be temperate and well qualified, lest it scald them, which may be moderated according to our Desire, by laying the Earth upon our *Hot-Bed* of a due Thickness, answerable to the *Heat* below it.

Having thus given my Opinion concerning the Qualities required in a *Hot-Bed*, I shall in the next place proceed to give proper Directions for making it. The *Dung* of *Horses* or *Asses*, such as is taken fresh out of the Stables or Stalls, is the most proper for our Purpose; it should then be thrown up into a Heap, with a few Sea-Coal Ashes among it, and very well watered. In this State, if the quantity be very large, it should lie to heat about eight Days; but two or three Loads only need not lie above half that Time before you use it. The Bed then must be marked out somewhat more than three Foot wide, answerable to the Size of your Frames; the Length of it running from *East* to *West*, so that it may face the *Sun*. Some *Gardeners* dig a Trench a Spit deep to make the Beds in; and others save that Trouble, and make it all above Ground. I have tried both ways, and find so little Difference, that I cannot say which is best; but, I think, if the Ground be wet and springy, it is most reasonable

sonable to make the *Bed* quite above Ground, lest the *Dung* be chilled. In the spreading of the *Dung*, we must chiefly have regard to lay it equal in every Part, that when the *Bed* comes to settle, it may not lie uneven; and besides that it may heat all together: The whole must be trodden down from time to time, as fresh Litter is laid upon it, till at length the *Bed* is of the Substance you desire, which ought to be (in *Winter*) about three Foot high.

Having thus prepared your *Bed*, set on your Frames, and put the Earth you design for it upon the *Dung*, laying it Ridge-wise, that it may be more conveniently turned over as you see occasion, if the *Bed* should burn: When you find the extreme *Heat* begins to abate, level the Earth upon it, to sow what Seeds you design; minding always to have upon your *Bed* five or six Inches thick of Earth, to prevent the extreme *Heat* of the *Dung* from spoiling your Crop; and that the Roots of whatever you sow or plant, may always keep free from the *Dung*, which, whether it be hot or cold, spoils most Plants that touch it. In short, to see the working of two or three *Beds*, if a Man is careful to make Observation of them, will better inform him than any written Directions; for some *Beds* will heat sooner than others. And again, I have known one *Bed* outlast three in its *Heat*, which depends partly upon the Nature of the *Dung* it is made of, and also in the true Method of working it. The Frames which cover these *Beds* likewise contribute greatly to the maintaining the *Heat* in them. A large Frame requires a greater *Heat* to warm the *Air* it encloses, than a small one: So if two *Beds* were made equally (as possible) of the same Strength, the one covered with a large Frame, and the
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other with a less; that with the large Frame would sooner cool than the other, and perhaps preserve a *Plant*, when those under a smaller Frame would burn: And the too frequent opening of a *Bed*, likewise contributes to cool it much sooner than it would otherwise be. In a word, rather desire such *Heat* only in your *Hot-Bed*, as will suffice to keep out the Frost, than covet to make your *Plants* grow quick.

But as it is not supposed that any *Hot-Bed*, without some Help, can maintain its *Heat* long enough to bring what we plant upon it to Perfection; so it is commonly practised when it begins to cool, to cut away the Sides of it slope-ways, and laying fresh *Dung* to them, it recovers its lost *Heat*, which is called *backing* or *lining* of a *Bed*; and this Work the skilful *Gardeners* will repeat sometimes five or six times in a Season, as they see Occasion, rather than make fresh *Beds*.

If a sufficient Quantity of *Dung* fresh from the *Stable* cannot be easily compassed, we yet need not be destitute of a *Hot-Bed*: Some *Horse-Litter* already cold; *Straw* steeped in *Pond-Water* two or three Days; *Grass*, *Coal-Ashes*; and, if they can be had, the *Grains* of *Malt* after Brewing, or damaged *Bran* made very wet; if they are thrown together in a Heap, and well watered, will ferment and heat as well as any *Dung* we can desire.

It remains now only that I give Directions for composing of *Earth* proper for our *Hot-Bed*, which should always be light, fresh, and well sifted, considering how tender the Roots will be of those things which are to grow in it. Take therefore of fresh sandy *Loam* one half, and add to it an equal Part of *Horse-dung* well rotted; let

let these lie in a Heap together well mixed, to be screened or sifted when it is wanted: Rotted Leaves, well consumed, are also good, if *Dung* is wanting.



CHAP. II.

Of MELONS, CUCUMBERS, and MUSHROOMS, *their Culture.*

HAVING in the foregoing Chapter given the necessary Directions for preparing a *Hot-Bed*, I shall now proceed to offer some Observations and Experiments I have made in the Culture of *Cucumbers* and *Melons*: And first concerning the Raising the *Plants* for the general or *Summer Crop*, for it is that we must depend upon for a Quantity of Fruit. Towards the Beginning of *March* is time enough to put in the Seeds of *Melons*, which we design for *Ridge-Plants*; those, if the *Bed* be moderately warm, and in good Temper, will come up and be fit to plant out four Inches apart, about a Week after sowing: They may thus remain till their first Leaf is about the Bigness of a Crown-Piece; and then when the second or third Joint appears, cut off the Prime Leader from each Plant, near the *Ear-Leaves* or *Lobes*, and they will each of them quickly put out three other *Runners*, which will produce Fruit plentifully; and those also are commonly pruned at every third or fourth Joint,

when they come to run: This is the common way.

About the latter End of *April*, or the first Week in *May*, the *Melon* Plants thus raised, will be fit to plant upon Ridges, which should be made thus: Cut a Trench about two Foot and half wide, and sixteen Inches deep; in which lay of Horse-Litter, prepared as I have directed, for the *Hot-Bed*, about two Foot thick, which will raise it somewhat above the Surface of the Ground. In this Work take care to spread the Dung equally, and tread it over gently to settle it; then at the Distance of about four Foot in the middle Line of the Ridge, make Holes about ten Inches over, and about six Inches deep, and fill them with the prepared Earth: After this, cover the whole with the same Soil, about five Inches thick, and make them into flat *Beds* four Foot wide, for the *Vines* to run upon.

About two or three Days after the Ridges are thus prepared, plant two *Melon Plants* in each Hole, sprinkling them with Water, (that has been warmed in the *Sun*) and covering them with Square or Bell Glasses; immediately upon which, either Mats or Straw should be put to keep the *Plants* from withering by the *Sun's* Heat, till they have struck Root; and so likewise should *Cucumber-Plants* be ordered, if they are planted out upon Ridges at this time of the Year, but they require no pruning.

About the latter end of *May*, or a Fortnight after planting, they will be in a growing Posture; and then if the *Easterly* dry *Winds* are ceased, tilt up the *Glasses* about an Inch in the Heat of the Day, to give them Air for two or three Hours, that by degrees they may be hardened to the Weather. It is now I cannot help taking

taking Notice of two or three things practised by the *Gardeners* in the *Culture* of *Melons* and *Cucumbers*; which, although they may perchance be generally practised, yet I am sure they deviate from the *Laws* of *Nature*; and *Experience* has shewn me, that their *Work* in those *Points* is needless, and might better be avoided. In the first place, when a *Melon*, or *Cucumber-Plant* is in Blossom, it is customary for them to pull off the false Blossoms, which they say would weaken the *Plant*; but if those are the *Male-Flowers*, as they seem to be, it is them that are ordained by *Nature* to set the *Fruit*, (which I think I have already explained.) In the next place, it is a common Practice to lay the several *Leaders* of the *Vines* at equal Distances from one another, and often lift them up to view the young *Fruit*, which is very hurtful; for that the *Vessels*, which convey the *Juices* to the *Fruit*, are very tender, and subject to be bruised by the least *Bending* from their *Place* of natural *Growth*. But yet, more than this; I have seen a *Bed* of *Melon-Plants*, which an ingenious *Professor* of *Gardening* has pruned and laid in *Order* (as he called it) with great *Dexterity*, and had no false Blossoms left upon them, that have from time to time offered abundance of *Fruit Blossoms*; and by being frequently handled and disturbed, have not set one *Fruit*; while, on the other hand, two other *Plants* of *Melons*, which were sown later by a *Month* or more, and had been disregarded, surprized him with several large *Fruit*, when he hardly expected to find them in Blossom: And so in the *Vines*, for forward *Cucumbers*, the *Fruit* that sets first, seldom comes to *Perfection*, because, upon all *Occasions*, the *Vine* is taken up to look how it comes forward; but in the most remote

more Corner of the *Bed*, where the *Plants* are the least regarded, commonly comes the first perfect Fruit. And lastly, I find another Practice too frequent, which I account as unreasonable as the others, and that is the exposing a young set Fruit to the *Sun*, by taking away the Leaves from about it. A Gardener of small Experience may know, that Fruit of any Sort grows best in the Shade, and that the immediate Heat of the *Sun* is only necessary for the ripening of Fruit, and not for the Growth of it; for the Sun-Beams falling directly upon a *Plant*, dries and pinches the *Vessels* of it; so that the *Sap* wanting a free Passage, it is impossible it can fill the *Plant* so quickly and plentifully as it would do, if the Parts were larger and more open, such as they are always in the Shade; and that this is Truth, I appeal to common Experience, whether Fruit growing in the Shade is not larger than the same Kind growing in the full Sun.

In *Spain*, *Portugal*, and the South Parts of *France*, the *Melon Gardens* are seldom regarded after they are sown, till the Fruit begins to ripen. And I have observed that they do not fail of good and large Fruit in great Quantity, although they give them no other Dressing than what is necessary to prepare the Ground for the Reception of the Seeds.

It was the Opinion of some of the Ancients, that Women should not always be suffered to come among *Plants*; for that at certain Periods, the very Approach of a Female was pernicious and destructive to them: But that Notion, with many others of the like Nature, has long since been destroyed by Experience to the contrary, and seems only to have been maintained for want of better Judgment.

But

But now suppose our *Melons* are fully set, we may then count about forty Days to the time of their ripening, which I think is observed as a Rule among most experienced *Gardeners*: Give them gentle Waterings now and then, if the Earth be extreme dry; for *Melons* do not delight in abundance of Wet; neither will the *Fruit* be well tasted, if the *Plants* are kept too moist. But *Cucumbers* love frequent Refreshings of Water, and will not prosper without it. Upon the setting of a *Melon*, it is commonly practised, and with good Reason enough, to pinch or prune off the running Branches two Joints above the *Fruit*; so that all the *Sap*, appointed for the Nourishment of that Branch, may be turned into the young *Fruit* for its Nourishment. This may contribute to make the *Fruit* large, if it be well guarded with *Leaves* from the scorching Rays of the *Sun*, during the time of its Growth: But as soon as it is fully compleated, then indeed it cannot well be too much exposed to the *Sun's* Heat, even to receive it through a Glass, which will forward its ripening, as may be known by the agreeable Odour it will send forth when it is fit for the Table.

For the more certain producing of *Melons* of a right Flavour, let me advise that no *Cucumber Plants* be set near them, lest the *Male Dust* of the *Cucumbers* should happen to be carried with the Wind upon the *Blossoms* of the *Melons*, and perhaps set them for *Fruit*, which will then certainly give the *Melons* so produced the Flavour of the *Cucumber*, in Proportion as the *Farina* happens to fall in greater or lesser Quantity. See Part I. Chap. II. of the Generation of Plants.

During the Growth of the *Vines*, the Earth they run upon should be carefully kept weeded,
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and stirred gently on the Surface ; for the Roots both of *Melons* and *Cucumbers* are tender, and always shoot out in length as far as the Branches reach ; but some indeed, more than others, are subject to run into *Vine*, and that for two Reasons : *First*, all *Plants*, either of *Melons* or *Cucumbers*, as their Fruit is greater or smaller, produce *Vines* of greater Size, or lesser Proportion. I have known *Vines* of large *Melons* that would shoot (if they were left at Liberty) about six Foot in a *Summer*, and the small Sorts have not grown two Foot ; and so in *Cucumbers*, one Root of the large *Turkey Kind* has produced as much *Vine* as four or five Roots of the short prickly *Cucumber*, which ought to be considered when we plant the Ridges : One *Plant* of a large Kind, if it thrives, will be enough for one Hole ; when perhaps of the smaller Sorts, three or four may be necessary for the same Purpose. But *Secondly*, All fresh *Seeds* of *Melons* and *Cucumbers* will produce much larger *Vines*, than those *Seeds* which have been kept several Years. New *Seed* is apt to draw such Plenty of Nourishment, that it is seldom prolifick ; for too hasty Thriving is ever an Enemy to Breeding or Prolificity. So on the other hand, when I have sown *Melon* and *Cucumber Seeds* of seven or eight Years old, the *Vines* have been close jointed, and more subject to produce Fruit.

The *Italians* have a *Melon* which is commonly ripe about *Christmas*, and esteemed among them as a Rarity : Some of the *Seeds* of it I have now disposed of to several Persons in *England* ; but I know not whether every one is acquainted with the right Method of its Management ; therefore I shall venture to give my Advice concerning the raising and preserving that Rarity of the *Winter* ;

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The Seeds should be sown towards the latter end of *April*, or in *May*, in a Bed moderately warm; and the *Plants*, when they are come up, be so ordered, that the Fruit should not come to its full growth till the end of *September*; the natural Warmth of the *Summer*, without any Art, will be sufficient for that End, till the cold Evenings in *August* begin to approach; then it will be necessary to shelter both the *Plants* and *Fruit* from the *Frosts* and cold *Dews*, till you think your Fruit will grow no bigger; and in the Heat of the Day, strip the *Plants* of their *Leaves*; let the Sun then dry the Stalks, and pull them up by the Roots, to hang up afterward in a *Green-House*, or some well exposed Place, to dry more thoroughly; after which they may be ty'd up by the Stalks in a dry Room, or laid in Chests of Bran, Wood-ashes, or very dry Sand, to keep them from the *Winter Air* till *Christmas*: If they are not then ripe enough, wrap them in a Cloth, and lay them in a Horse-dunghill for about twenty-four Hours, which will ferment their *Juices*, and cause Ripeness; as I have heard, and am apt to believe.

But seeing that the Pride of the *Gardeners* about *London* chiefly consists in the Production of *Melons* and *Cucumbers* at Times either before or after the natural Season, I shall also prescribe some Rule for the Raising and Cultivating them at those Times; which I shall lay down in as plain Terms as possible.

Most of the *Gardeners* I am acquainted with make their *Seed-beds* for these *Plants* in *January*, although sometimes the Ground is cover'd at that time with *Snow* near a Foot thick; but I must confess, I shall never follow that Method, while I have any regard to the Ways of Nature: For
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is it reasonable to believe, that young *Plants*, tender as they must be, when they are thus just forced out of the Ground, can be able to withstand the least *Air* from abroad, when *Frosts* and *Blasts* continually reign? And to preserve them without *Air* is as impossible: Therefore to go more reasonably to work, prepare a *Hot-Bed* about four Foot square, and two Foot high, in the first Week of *October*, and sow the *Seeds* both of *Melons* and *Cucumbers* in it, when the Heat of it is moderated; a Week after they are come up, plant them four Inches apart on the same *Bed*, after having stirred the Earth very well. In this Month the Days are commonly warm, and in such Weather they ought to have as much *Air* as you can possibly give them; but the Nights are uncertain, and therefore the *Plants* must then be covered up close with the *Glasses* and *Mats* over them. In this first raising of the *Plants*, a skilful *Gardener* may make them as hardy as he pleases; for it is not his Business so much to draw or force them, as to strengthen them against *Winter*.

All *Annuals* are as naturally disposed to live from the Autumn to the Spring, if they are kept from flowing in the *Winter*, as they are commonly known to flourish in the *Summer* Months; and both *Cucumbers* and *Melons*, which are likewise of the *Annual* Race, might as well be kept the *Winter*, as any other *Exotick Annual* whatsoever, if we would not let them blossom before *Christmas*. I have myself kept young *Plants* of *Amaranths*, and of the *Nasturtium Indicum*, which I sowed in Autumn, till the *Summer* following, only in a common *Green-House*; and I am persuaded *Cucumber Plants* might be preserved almost with as little Trouble. I am informed, that

that the last Year a *Gardener* sowed some *Cucumber-Seeds* as soon as he had gathered them, and cut Fruit from those *Plants* very early in *January*.

When the *Plants* are in the second Joint, I would advise that they be either planted in small *Garden-Pots*, or *Baskets*, open on their Sides, made with *Oziers*, about ten Inches over the Top, and four Inches deep; so may we more easily remove them without Damage from one Bed to another, as the Severity of the Season may require: But I prefer the *Baskets* rather than the *Pots*; because when the *Plants* begin to run, the *Roots* are at full liberty to find their way into the neighbouring Earth of the Bed they are to stand in, without transplanting, which might endanger them. In one of those *Baskets* may be planted about five or six *Plants*, lest any of them should go off; though it is reasonable to believe, that a *Plant* which has had the Advantage of a gradual declining Season to harden itself in, will not be so subject to suffer by the Weather, or require so much Heat to maintain it, as those which make their first Appearance in the midst of Frost and Snow. In short, let the *Gardener* rather endeavour to defend them from the Weather, than to force them: As the Bed cools, let him line the Back and Front of it with fresh Dung; let the *Plants* receive as much Air and Sun as he can reasonably give them, and guard them well with Straw and Mats in the Night, and there is no doubt but he will have Fruit early enough: But I speak to the Ingenious, who may yet improve what I have said, and not to those who despise Learning, because they know little.

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I shall now conclude this Section with a word or two concerning the Raising of *Cucumbers* on the natural Ground for Pickling; for this we have no more to do than chuse a Piece of Ground pretty rich, and well exposed to the Sun; and after having wrought it well with a Spade, make Holes in the form of Basons, about four Foot distant from each other, and sow the Seeds in them the first Week in *May*, if the Weather be settled; put at least a Dozen Seeds in a Hole; for it is much better to have *Plants* to fling away, than to want a Crop, which often happens by being too covetous of Seeds.

S E C T. II.

Of MUSHROOMS.

WHoever has been accustomed to eat *Mushrooms*, will certainly allow them to be one of the greatest Dainties the Earth affords, especially the *Morel*, *Truffle*, and *Champignon*: The two first have been found in but few Places in *England*; but I am apt to believe they are as plentiful with us as the other, if they were skilfully sought after: They are to be met with in the Woods: the *Morels* chiefly appear in *April*, and the *Truffle* about that time may be dug out of the Ground, for they never appear above the Earth. Those who make it their Business in Foreign Countries to gather the *Truffles*, have only one way (as I can learn) to find out where they grow, and that is by the help of a Hog, who they lead in a String through the Wood, suffering him to root up the Earth as he goes along; for Swine being very voracious of them, discover them

them by their Smell, and turn them out of the Ground: Of these Kinds I have not known any that have been propagated by Art, as the *Champignons* have been; which, tho' this last Kind is common enough in many Places in *England*, without any Culture, yet it turns to good account to raise them in our Gardens, since the Trouble of doing it is not considerable, and their Use begins to be known. The true *Champignon* has its Flesh very white, first appearing like a Button, with a Footstalk adhering to it; the Chives within it are of a Flesh-colour; and as the Cap of it explains itself, those Chives become darker by degrees, and are at length black. I have seen some of the Caps when they have been fully explain'd, about six Inches over, and of a considerable Thickness. This Kind is the only Sort I can recommend for its Goodness among the *Cap-Mushrooms*, and then only when they are fresh and free from Worms, which are apt to breed in them, their Stalks especially, and such are not accounted wholesome. We commonly find this Sort growing in rich Pasture-Grounds, about the latter end of *July*, or in *August* and *September*, after the Rains have fallen.

The Observations I have made concerning the natural Produce of *Mushrooms* seem to discover that they are produced by some Putrefaction in the Earth, or in those Bodies they are apt to grow upon: We have not in *England* less than one hundred different Kinds that I have observed, besides those very minute Sorts that can only be discern'd with the *Microscope* in the Moldiness of Fruit and Liquors; which last Kinds are so quick of growth, that in less than twelve Hours time they are perfected; and shedding their Seeds, several Hundreds of the same Kinds immediately vegetate; whence it is that

Mouldiness so soon overspreads those Bodies it once infects.

The Rings of *Mushrooms*, which are often seen upon Downs, Plains and Commons, are called by the Country People, *Fairies Dances*; these are not always of one Sort of *Mushroom*, but various, according to the Soil that produces them. It is observable, that the Grass is always much greener and ranker in the Line where those *Mushrooms* appear, than in other Places of the same Grounds, which I have often wondered at, as well as the exact Figure of a Circle they have represented. When I enquired into the Reason of this strange Production, I discovered two things worth Observation; the first was, that just under the Turf where the *Mushrooms* were growing, was a Tract or Path made by *Pismires*, which was not only hollow in many places at that time, but the very Covering of that Passage was made of Earth extremely fine, which those Creatures had flung up. The Fineness of the Earth wrought by those laborious Animals might very reasonably contribute to the extraordinary Vegetation of the Grass growing upon it; and the Howness of the Ground underneath might produce that Mouldiness within it, which afterwards might be formed into *Mushrooms*; for it has always been my Opinion, that if Earth is made extremely fine, and by that means the *Salts* of it more at Liberty to act, whatever grows upon it will be much more vigorous. Again, we find by Experience, that in such Places where the Ground lies hollow near the Surface, it always turns musty and mouldy.

But, Secondly, *Garden Snails*, the large black *Dew Snails*, and others without Shells, called *Slugs*, when they couple, always make Choice of
short

short Grass to creep upon: It is their Manner, when they generate, to take a large compass upon the Ground, and meet one another. Thus I have seen them creep in a Circle for more than half an Hour, going over the same Ground at least twenty times before they could join, leaving upon the Grass where they crept a viscus, shining Matter. So that it may be, that Slime, when it putrifies, may produce the *Musbrooms* we find growing in Circles upon Commons; and I am the more apt to believe it so, because I have more than once observed, that where a *Snail* has left such a Tract upon the Grass, a few Days afterwards I have found *Musbrooms* to come up: But it must be observed, that such as come up in this manner are not fit to eat. However, I suppose from Hints of this kind it was, that the edible Kind was first propagated in the Garden.

It is practised in *France*, to dig a Trench five or six Inches deep in the Ground, and lay in it either the Dung of *Horses*, *Mules*, or *Asses*, ridge-wise, in the shape of an *Ass's* Back; then cover the Dung about an Inch thick with fresh Earth, such as is just taken from under a Turf, rather sandy than otherwise, and then cover the whole Bed either with Straw, or dry Litter, as well to defend it from the Frost in the *Winter*, as from the scorching Heat of the *Summer's* Sun. The Bed being thus prepared, water it twice or three times a Week, without taking off the Covering of Straw, and in about a Month's time the *Musbrooms* will begin to appear, and must then be drawn up by the Root. These Beds may be made every Month, to produce *Musbrooms* all the Year about.

The late famous Mr. *Harrison* of *Henly* made *Musbroom*-Beds much after the same manner, on-

ly instead of Horse-dung he made use of old Thatch, which he told me turn'd musty, and grew moldy much sooner than Horse-dung, and would produce *Mushrooms* quicker, and in greater plenty.

So I have likewise known some *Melon Ridges*, which have been thinly covered with Earth, have produced *Mushrooms* about *Autumn*, especially if Straw or Litter has been laid upon them about *August*.

It is said, that the Cuttings of the *White Poplar* or *Abele*, about the Root, being steep'd in hot Water well fermented with *Yeast*, will produce very good *Mushrooms* in a few Days: And it is likewise reported, that the loose Chips of the same Tree, being buried in a decay'd Hot-Bed, will do the like.

About *Naples*, there is a sort of Stone which produces good *Mushrooms*, if it be laid in a moist Place, or well water'd.



CH A P. III.

Of ESCULENT ROOTS, or such as are proper for Table Use.

THE *Roots* which are commonly made use of for the Table are *Parsnips*, *Carrots*, *Turneps*, *Skirrets*, *Scorzoner*a, *Beets*, *Radishes*, *Horse-Radishes*, *Potatoes*, *Jerusalem Artichoke*, *Onions*, and *Leeks*, and their Kinds.

SECT.

S E C T. I.

Of the PARSNIP.

TO begin with the *Parsnip* : It affords a large sweet *Root*, very nourishing, and of great use in the *Winter*. This *Plant* delights in a rich Soil, where the *Root* of it will become very large ; but should not be eaten till the Frosts have enter'd the Ground. The *Seeds* of it are sown in *March*, and will come up in about three Weeks time : When they have been above Ground about a Month, they must be hoed, leaving the Space of five or six Inches between the Plants. A skilful Gardener will sow *Radishes* among them, which in about forty Days may be drawn off ; or sometimes *Spinage*, which will be also fit to cut before the *Parsnips* begin to spread. And indeed, it is not the least Part of a Gardener's Skill to understand how to double crop his Ground with such things as will not spoil one another. After the first Hoeing of the *Parsnips*, keep them as clean from *Weeds* as possible, till they are full grown, and then take them up, and keep them in Sand for Use, cutting off all their green Tops three or four Days before we lay them up.

S E C T. II.

Of the CARROT.

CARROTS delight in sandy Soil, where their *Roots* will grow to a great bigness, and be much sweeter and more free from Worms,

than those which are sown in rich Garden Ground. Sow those you design for *Winter* Use, at the same time you sow *Parsnips*; and in the same manner fling in among them *Radishes*, and a few *Lettuce*: When they are come up, hough them as I have directed for the *Parsnips*, and take them up when they are full grown, to be kept in Sand for *Winter*. About *London*, the Gardeners are curious to have young *Carrots* for the Spring; which they raise in the following manner: Towards the End of *July* they prepare a Piece of Ground, and sow it when it is most likely to rain; and about *Michaelmas*, if the Seeds be good, and the Weather has been favourable, the Roots will be somewhat larger than a Tobacco-pipe, and the *March* following will be fit to draw for the Table; but this Crop must be soon gather'd, lest they run to seed, which they will certainly do in *May*; and then they will not be fit to eat. But that there may not want some to succeed these, I have known an ingenious Gardener make a Hot-bed in *February*, which he cover'd about six Inches thick with Earth, and sow'd it with *Radish* and *Carrot Seed*, covering it in bad Weather with Mats upon Hoops. The *Radishes* will soon be fit to draw, and the *Carrots* be ready for the Table about *May*, when the Spring Crop is gone.

S E C T.

S E C T. III.

Of the *TURNEP*.

TURNEPS have many Excellencies, and are more generally propagated about *London* than any other Root; they are a wholesome Diet, and are of extraordinary Use to the Farmer for feeding Cows and Sheep. This kind of Root is always sweeter in a sandy Soil, than any other Ground; but will have larger Roots, if the Land be somewhat inclinable to *Loam*. From the middle of *July* to the 10th of *August*, and not later, the Seeds may be put into the Ground, that the Roots may have time to apple (as they call it) before *Winter*. When the Plants have two or three Leaves apiece, they should be hough'd at the Distance I prescribed for *Carrots* and *Parsnips*, and this Crop will be off time enough in the Spring either to sow *Barley*, or any other Grain or Seed, on the same Spot. It is seldom practised, tho' I think it would be very acceptable, to provide *Turneps* for the *Summer*: And indeed I see no reason why we may not have them all the Year about: We may sow them in the Spring as well as at Autumn; but planting them out for Seedling Plants in the Spring and Summer Months will do much better. I have more than once known the Experience of this way, and find it to answer as one would desire.

S E C T. IV.

Of the *SKIRRET*.

THE *Skirret* has a very agreeable Root, although it is propagated but in few *Gardens*; and it may be, the Rarity of it is owing to the want of the right way of cultivating it. We may propagate it two ways, either by sowing the Seeds in *March*, or by transplanting the *Off-sets* from the *Roots* in that Month: It delights in a light, rich Soil, somewhat moist, which I find contributes to make the *Roots* large. Some Years since a *Gardener* in *Surrey* sent to me for some Seeds of this *Plant*, and sow'd them in a black, moory Soil, which had lately been a *Plantation* of *Asparagus*; in that Spot of Ground he had the largest *Skirrets* I ever saw, and very sweet: But about *London*, 'tis more generally practised to raise them from Slips, or Sets; which must be done thus: In *March*, when the Leaves begin to put forth, take them out of the Ground, and part them into as many Slips as you can take off with *Roots*; but be sure let only the fresh springing *Fibres* remain on them, and not any of the old *Roots*; then prepare *Drills* about four or five Inches deep, to plant them in five or six Inches apart, and keep them well water'd till their *Roots* are full grown; then take them fresh out of the Ground, as you have occasion to use them. Some say the *Roots* will be larger, if they are not suffer'd to run to seed.

S E C T.

S E C T. V.

Of SCORZONERA, and BEETS.

Scorzonera, or *Spanish Salsify*, has a Root, which in my Opinion, is no less pleasant than the former: It loves a light Soil, and is easily raised by sowing the Seeds in *March*. And *Beets* also, both the Red and White Kinds, are raised in the same Month from Seeds, and delight in a sandy Soil.

S E C T. VI.

Of the RADISH.

I Have already mention'd the *Radish*, as a Root which might be sown promiscuously among other Roots in *March*; but some Particulars in the Culture of it yet remain worthy the Knowledge of my Reader: The Soil it chiefly covets is Sand, or other light Ground well wrought with the Spade: It may be sown in such Land any time between *February* and *September*, minding always to let the Ground you sow be more in the Shade, as the Season is more hot. I have sown some Seeds of the *Spanish Radish* in *August*, that have been fit to draw just as the *Winter* began, and have continued good till the *February* following: But to have a Crop to succeed those, it is common to sow some at *Michaelmas*, that they may be above Ground in their *Seed-leaf* only before *Winter*; and those will be in season about *March*, if they have had the Shelter of some warm Wall.

S E C T.

S E C T. VII.

Of the HORSE-RADISH.

THE next *Root* I have to treat of, is the *Horse-Radish*, which no *Kitchen-Garden* ought to be without. I have known some *Gardeners* plant *Roots* of it on a Piece of Ground three or four Inches deep, and then letting it stand three Years, have taken it up for Market: But a much quicker and better Way has been experienced by a Friend of mine for the propagating this *Root*; which was in this manner: Dig a Trench in some remote Corner of the *Garden*, about three or four Foot wide, and about sixteen or eighteen Inches deep: The Soil, if possible, should more incline to Sand than Clay; and at *Michaelmas*, which is the best time for this Work, cut some *Horse-Radish Roots* in Pieces of three Inches in length, or thereabouts, and sow them in the Bottom of the Trench, covering them with the Earth that was taken out of it; the Spring following you will find them shoot above Ground, five or six Heads from each Piece of *Root*, and the *Michaelmas* after that, will be strong enough to take up; they will then be strait, well grown, and without Knots, fit for Use.

We may observe, that the *Roots* which we are to use for sowing in this Trench, should be full of Knots, for 'tis from the Knots only we are to expect any Shoots.

S E C T.

S E C T. VIII.

Of POTATOES.

POTATOES, and *Jerusalem-Artichokes*, are Roots of less note than any I have yet mention'd; but as they are not without their Admirers, so I shall not pass by the Method of their Culture in silence. The *Potatoe* rather loves a sandy, than a strong Soil, though I have seen them do well in both; but have observed, that the Roots knot much better, and are sweeter tasted, in the Sand. The smaller Roots or Knots of them are commonly sowed to raise a Crop from, and set about four or five Inches deep in the Ground in *March*, at six or eight Inches a-part. When the Haulm begins to decay, which is about *Michaelmas*, we may take them out of the Ground with Forks as we have occasion to use them. Where they have liked the Ground, I have seen above thirty Knots or *Potatoes* hanging on the Strings or Fibres of one Plant.

The *Jerusalem-Artichoke* affords a Root as large as an ordinary *Turnep*, which in its Taste differs from the *Potatoe*, it being more watery and flashy. It is one of those Plants which can hardly be got out of the Ground it is planted in, and delights chiefly in a stiff Soil, where I have most commonly seen it growing. Every little Part of the Root will grow, if they are planted in the Spring like the *Potatoe*; and about the *Michaelmas* following will be fit for use.

S E C T.

S E C T. IX.

Of the O N I O N.

I Now come to treat of the *Onion*, a *Root* more generally used in the *Kitchen* than any other. Of this there are two Kinds worth the *Gardener's* Care: The first is the *Spanish Onion*, which affords a large sweet-tasted *Root*; and the other, the *Stratsbourg Onion*, which is more biting, and lasts good much longer than the former; but the Difference of these two Kinds makes no alteration in the Culture of them: They should both be sown early in *March*, in rich Garden Soil, and houghed about the latter end of *April* with a very small Hough, leaving about three Inches between the *Plants*, till they begin to grow fit for *Sallets*, and then they may be drawn or thinn'd where they stand close together. In the sowing of this Crop, let not the *Gardener* be too sparing of *Seeds*, lest many of them be naught, which often happens; and it may be too late in the Year to re-sow the Ground, when he is convinced the first *Seeds* have fail'd; better too many than too few; the Ground may be eas'd of too great a Burden, sooner than over-loaded with it. When the *Leaves* begin to change their Colour, the *Roots* will grow no more that Year; and then they may be pull'd up in dry Weather, and laid in Rows exposed to the Sun, till they are dry'd as well as may be without doors: After which let no Rain get at them, but spread them on the Floor of a *Green-house*, or such cover'd Place, to dry more thoroughly for laying up for *Winter*. Some of this Store may perhaps remain good till towards

towards *April*, if they were well dry'd at gathering, and kept so afterwards; but it will be impossible, with the greatest Care, to keep many of them from growing in the House; and of those which happen to *spire* about the Beginning of *February*, and have large *Roots*, plant them at two Inches distance, in Lines half a Foot a-part, to bring *Seeds* for another Year. When these have shot up the *Flower-stems* about two Foot high, secure them with Sticks from the Assaults of the *Winds*; and as soon as the *Seed-vessels* begin to open, cut them off, and spread them on a *Mat* in the *Sun* to ripen, turning them every Day, for a Fortnight or three Weeks, before they will be fit to be beaten out of their Husks: Take special care no Wet get at them, for they will sprout with the least Moisture, and never afterwards be fit to sow. It is a certain Rule, that if any *Seed* has had Moisture enough to put forth its *Radicle* never so little, and is after that, check'd before the *Ear-leaves* appear, it cannot by any means be made to grow afterwards.

The Beginning of *August* we must sow a fresh Crop in some warm Place to stand the *Winter*, and supply the *Kitchen*, when the dry'd *Onions* are gone. The Sowing will be fit to draw in *April*, and furnish a Supply till the Spring Crop comes in.

S E C T. X.

Of the LEEK.

THE *Leek* is sown in *March*, in a well-wrought Ground, and should be hough'd like the *Onions*, and kept free from *Weeds*. In *July*, about the middle of the Month, plant them out in Lines
about

about five Inches a-part, in very rich, light Soil, but chuse wet Weather, if possible, which will contribute to make them very large; for one Shower of Rain does more good to any new transplanted Herbs than twenty Waterings. The *Leek* will not bear *Seed* till the second Year, and then must be gather'd, and order'd like *Onion-seed*.

S E C T. XI.

Of GARLICK.

GARLICK is propagated from *Cloves* of the *Root* planted early in *March*, about five Inches a-part: The Soil light and sandy, for stiff Ground makes the Roots small: The *Blade* will begin to turn yellow in *July*, and then take them up in a dry Day, and tie them in Bunches for Use. This, and all other Roots, that are to be kept the *Winter*, must be very well dry'd, or they will rot.

S E C T. XII.

Of ESCHALOTS.

E*Schalots*, or *Shallots*, are of such use in *Cookery*, that a *Kitchen-Garden* ought not to be without them: A light, sandy Soil is the most agreeable to them, without any Mixture of Dung. They are propagated by planting their *Cloves* or *Offsets* of the *Roots* early in *March*, about four Inches a-part, and will be fit to take up as soon as their *Blade* turns yellow, which will not be till the latter end of *June*, or beginning of *July*, if they like the Ground; then let them be well dry'd and laid up for Use. N. B. About a Rod square of Ground

Ground planted with these *Roots* will be enough for the Use of any Family.

S E C T. XIII.

Of *CHIVES*, and the *ROCAMBOLE*.

CHIVES should always be found in the *Kitchen-Garden*; they are frequently used in the *Winter Sallets*, when young *Onions* are scarce. The *Off-sets* of their *Roots* should be planted at six Inches distance in *March*, cutting off their *Blades* at the same time: They love a light, rich Ground, and Shade. Thus order'd, they will be fit for use at any time of the Year; and the oftener they are cut, the smaller will be their *Grafs*. About one Rod square of them will serve a large Family.

The *Rocambole*, for its high Relish in *Sauces*, has been greatly esteem'd formerly, but now-a-days is hardly to be met with; I think however, it should not be wanting in a compleat *Kitchen-Garden*; for, considering how small a Quantity of it is sufficient to give us that Relish which many *Onions* can hardly give, it ought to be preferr'd. The Part of this *Plant*, which is made use of, is the Head of the *Flower-stem*, composed of many small *Bulbs*, which, as soon as they are ripe, should be gather'd, and kept dry.

It is propagated by planting the *Off-sets* of the *Roots*, or little *Bulbs*, six Inches a-part in *September*; and delights in a sandy Loam, without any Mixture of Dung.



C H A P. IV.

Of *ASPARAGUS*, *ARTICHOAKS*,
COLLY-FLOWERS, *CABBAGES*,
and those of the Cole-Race.

THE *Asparagus* is one of the great Dainties of the Spring, and what I account to be part of the most necessary Furniture of a Garden; it brings great Profit to the *Gardeners* near *London*, either propagated upon natural *Beds*, (as they are called) or when they are forced with Dung in the *Winter*. I have heard, that a *Gardener* about *Westminster* has received above thirty Pound in one Week for forced *Asparagus*.

I shall therefore be very particular in setting down the Method of propagating this *Plant*, as well in *natural Beds*, as in the *Hot-Bed*; and first begin with the *Seeds* and manner of raising them.

Such as are minded to make a Plantation of *Asparagus*, should have a peculiar Regard to the Goodness of the *Seed* they design to sow, for therein lies the chief Hopes of Success: The largest *Buds* therefore should always be encouraged to run up as soon as they appear above Ground; and when they begin to branch, must be staked up to secure them against the Winds. These vigorous Shoots will afford us *Seeds* well nourished, partaking of the Strength of the *Mother-Plant*. The largest I have yet seen are the Produce of *Battersea* in *Surrey*, and such-like Places, where the Soil is *sandy*; so that we may readily infer what Soil is the most proper for them. In Ground of that Kind, without any
Mixture

Mixture of Dung, I recommend them to be sown about the first Week in *March*, if the Weather be open. In this Seminary they come up without any Trouble, and will be fit to plant out the *February* or *March* following, either to train up for *Hot-Beds*, or to be planted for a Crop in *Natural Beds*; for *Plants* of one Year old will thrive much better when they come to be transplanted in *Natural Beds*, than those that have stood two Years in the *Seed Bed*.

If we raise them for the *Hot-Bed*, make choice of a Piece of Ground that has been enriched with Dung, and well dug and mellowed; upon which strike out Lines at seven or eight Inches a-part, and plant the *Asparagus Roots*, when they are one Year old, in them, at four Inches Distance. In this Nursery they are to remain two Years before they will be fit for the *Hot-Bed*, cutting down their *Haulm* every *Michaelmas*, and keeping them free from Weeds, as we must do the Plants in the *Natural Beds*.

If we chiefly covet to raise *Asparagus* in the *Winter*, sow every Year, and make Plantations after the same manner related, to have Plants that may succeed one another. The *Hot-Beds* must be made pretty strong, and covered immediately with Earth six Inches thick, encompassed with *Straw-Bands*; in this, plant your *Asparagus Roots* (taken fresh from the *Nursery-Beds*) as close as they can be placed together, without trimming them, or cutting off any of their *Fibres*. When this is done, cover the Buds of the Plants two Inches thick with Earth, and let it remain in that State for five or six Days before the Frames or Glasses are put over it, and then lay on three Inches thick of fresh Earth over the whole; in about ten Days after planting, the Buds will begin to appear above Ground, and then give them

what Air the Season will allow ; for it is the Air that makes them green, and chiefly contributes to their good Taste.

A *Bed* thus prepared will last good about a Month, shooting fresh Buds every Day, if the severe Weather does not hinder. As it begins to cool, some warm Horse-Litter should be laid upon the Glasses every Night, which will contribute as much to make the Buds shoot, as if they were to have new Dung put under their Roots. The time for this Work is from *November* till *April*, when the natural Crop comes in, making fresh Beds every Month to follow one another, and give us a constant Supply.

But to plant *Asparagus* for a *natural Crop*, we must proceed in a very different way. About the Beginning of *March* (which is the best time for transplanting of *Asparagus*) measure out your Ground, allowing four Foot for the Breadth of each *Bed*, and two Foot for every *Alley* between the *Beds* ; open a Trench at one End of it, and lay into the Bottom of the Trench, about the Thickness of six or eight Inches of Horse-Dung well rotted: Go on then to trench the same Quantity of Ground, lying next to the first Trench, throwing the Earth which comes out of the second Trench upon the Dung laid in the Bottom of the first: Continue to work in like manner till the whole Piece is completed and levelled ; then in Lines, at eight or ten Inches Distance, plant the *Asparagus* taken fresh out of the *Nursery*, spreading their Roots, and covering their Buds with Earth, about four Inches thick.

When four Rows are planted, leave a Space for an *Alley* about two Foot wide, and proceed to plant four Rows more for another *Bed*, and so continue your Work till the whole is planted. As soon as that is done, sow the whole Piece with

with *Onions*, and rake it over as level as possible, for the *Alleys* will not be of any Use till after *Michaelmas*, when the *Onions* will be off, and the *Shoots* the *Asparagus Plants* have made that *Summer*, must be cut down; then dig up the *Alleys*, and throw Part of their Soil upon the *Beds*, to raise the Earth about five or six Inches above the Buds of the *Plants*, supplying the *Alleys* at the same time with Dung, or some rich Soil!

In this State let the *Beds* remain till *March* following, and then rake down the Earth. I have known some Gardeners set *Beans* about *November*, in the *Asparagus Alleys*, close under the Sides of the *Beds*, which may best shelter them from the *East Winds*.

The *Alleys* must be turned up in this manner every *Winter*, and now and then enriched with Dung; but we must be sure to let *Michaelmas* be passed before we cut down the *Haulm* of the *Asparagus*, and give them their *Winter Dressing*; and also that we are not later than *Mid-March*, without raking and laying smooth the *Beds*; for after that time, if we should disturb the Earth, we should run the Hazard of breaking many Buds that begin to shoot.

It is a general Rule not to cut any till the fourth Year after Planting, although the *Buds* are very large, for it weakens the *Roots*: However, I think, (to satisfy the Impatience of some) that where the *Plants* are strong, as in the third Year, a few may be taken here and there in very small Quantities, about six times in the Season, without greatly hurting the *Plants*.

The fourth Year we may certainly begin to cut, and we shall then sensibly feel the Profit of our Labour and Expectation: Not any Bud that appears above Ground must be suffered to grow in the Cutting Season, unless they come from such

Roots as have been planted to make good the Deficiencies of the first Plantation, and those must be suffered to run up every Year till they have gathered Strength.

About the Beginning of *April*, the *Asparagus* appear above Ground, and may be cut till towards the Beginning of *June*, when they have stood five Years; but will not bear cutting longer than *Mid-May*, if they are younger. In the cutting of them, have a special Regard to cut downwards a little sloping, with a Knife made blunt at the Point, lest you injure the *Crown* of Buds lying on the top of the Root; for if you cut them more horizontally, you may then injure several Buds that are under ground. A Piece of *Asparagus*, thus carefully managed, will last good near twenty Years.

S E C T. II.

Of the ARTICHOAK.

WE may either propagate the *Articboak* from *Seed* or *Suckers*, but the latter is most commonly practised; however, let us use either way of raising them, we must be sure to allow them a strong rich Ground, with Dung mellow'd in it, well-exposed to the Sun: About the Beginning of *March* we may sow the *Seeds*, to be planted out the following Month; and the middle of *March* is the most proper Season to slip the Roots, either for new Plantations, or to make good the Deficiencies of the old ones, which seldom pass a *Winter* without some Loss, notwithstanding the greatest Care has been taken to preserve them. When we take off the *Slips*, we must leave growing upon every old Root (if it be strong) three Heads, which will give us so many good Blossoms
about

about *Mid-June*; and the *Slips* we take off should be planted two Foot a-part in Lines, four Foot distant from each other, for nearer than that would hinder the thriving of the *Plants*. This young Plantation must be well watered after planting, and perhaps may afford us some good Flowers about *September*, though, for the Sake of the *Plants*, it is to be wished they would not; for when they blossom the first Year, the Roots are endangered; therefore some *Gardeners* break off the Blossoms as soon as they begin to appear, and about the Middle of *July* break off the Stems of the old Roots that have done blowing, that they may furnish themselves with fresh Shoots to stand the *Winter*.

S E C T. III.

Of the COLLY-FLOWER.

WHOEVER is minded to propagate this *Plant*, must chiefly have regard to the Goodness of the *Seed*, which ought to be saved only from such *Flowers* as were large and white, for otherwise there can be no Hope of Success; and in the next place, the Ground must be very rich, and not over dry. Being thus provided, we may begin to sow the *Seeds* in *March*, in some well-exposed Corner of the *Garden*, where the young *Plants* may be sheltered at their first coming up from the frosty Evenings. About the Middle of *April*, when they are in their first *Leaf*, they must be planted in a *Nursery*, about five or six Inches a-part, and stand there till the latter End of *May* or *June*, to be removed to such Places as you design they shall blossom in: If it is possible, do this Work in rainy Weather, which will make them strike Root quickly; or

U 3

else,

else, if the Season happens to be dry, make Holes in the Ground like Basons, about three Foot a-part, and water them well immediately before you plant the *Colly-Flowers* in them, which will contribute to keep the *Plants* fresh and green, till their Roots begin to shoot; by this means, and frequent Waterings when the Season is dry, we may expect large Flowers in Autumn, but especially if the *Alleys* between the *Plants* are floated with Water, which will nourish them much more than common Watering. Some of this Plantation will not offer to flower till after *Michaelmas*, and then such *Plants* must be taken up with the Earth at their Roots, and set together (upright) in a *Green-House*, or some other such-like Place, where the Blossoms will enlarge themselves, and be fit for Use in the *Winter*: So likewise if we have any *Artichokes* at that time fit to cut, take them with all their Stalk, and set them in Sand in the same Place, which will preserve them good a long time.

But we must take a very different Method to have *Colly-Flowers* in the *Summer*: About the 20th of *July*, or first Week in *August* at farthest, we must sow the *Seeds* upon some decayed *Hot-Bed*, and transplant them about three Inches Distance, as soon as they have made their first *Leaf*, upon some other well prepared *Bed*. The Middle of *September* draw out every other *Plant* from that Plantation, and set them four or five Inches a-part, either under a *South-Wall*, to stand there till Spring, when they are to be planted out for Flowering, or else set them in the Places where they are to blossom, and cover them with *Glass-Bells* in the Severity of the *Winter*; and this last Method I think to be the best, because they will be well rooted in the Spring, and consequently be better able to make large Blossoms than those that

that are planted in the Spring, and have the Difficulty of making new Roots when the others are growing.

Those *Colly-Flowers* that are planted out at *Michaelmas* will flower about three Weeks sooner than those that are planted in the Spring; however, it is necessary to make Plantations in both Seasons, that they may not all blossom at one time, but gradually succeed one another. An understanding Gardener will also make his Spring Plantation of *Colly-Flowers* at several times, allowing three Weeks or a Month between each; and by that means, (although all the Plants were raised at one time) the checking them at different Periods of Growth, will make them blossom earlier or later by two or three Months.

It is a Rule which ought to be observed, when we plant late in the Spring, (in *May* for Example) to set our *Colly-Flowers* where they may not have too much *Sun*. I have known some do very well between *Artichoke* Plants, and in such-like Places; and then it must also be observed that they have Water enough, for they are great Lovers of it. When the Blossoms begin to appear, break some of the great Leaves and lay over them, to keep the *Flowers* from Rain, and the scorching Heat of the *Sun*, which would make them turn yellow.

In *March* and *April* take care to shelter them from the Winds, which are very apt to damage them, and sometimes blow them up by the Roots. I would advise, that if you have a good kind of *Colly-Flower* that blossoms early, and has large and close *Flowers*, to let some of the forward *Plants* stand for *Seed*, carefully tying them to Stakes, that the Winds may not injure them. When the *Seed-Vessels* are full grown, and the *Seeds* within them are perfected, cut off the whole Stalk, and

else, if the Season happens to be dry, make Holes in the Ground like Basons, about three Foot a-part, and water them well immediately before you plant the *Colly-Flowers* in them, which will contribute to keep the *Plants* fresh and green, till their Roots begin to shoot; by this means, and frequent Waterings when the Season is dry, we may expect large Flowers in Autumn, but especially if the *Alleys* between the *Plants* are floated with Water, which will nourish them much more than common Watering. Some of this Plantation will not offer to flower till after *Michaelmas*, and then such *Plants* must be taken up with the Earth at their Roots, and set together (upright) in a *Green-House*, or some other such-like Place, where the Blossoms will enlarge themselves, and be fit for Use in the *Winter*: So likewise if we have any *Articboaks* at that time fit to cut, take them with all their Stalk, and set them in Sand in the same Place, which will preserve them good a long time.

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let it dry in the House before it be thrashed out; for it is not necessary to leave the *Seed* upon the *Plants* till the *Pods* are dry, lest they open and shed.

S E C T. IV.

Of CABBAGES, and their Kinds.

WE have several kinds of *Cabbages*, the large *White Cabbage*, of which the *Gardeners* at *Battersea*, in *Surrey*, have a kind that comes very early, and is the best for *Summer Use*: If it be sown in *July*, and stands the *Winter*, I have known some of them ripen in *May*; or else, if we are minded to have of them ripe in the *Winter*, sow them in *March*, and plant them out in *July*, at two Foot Distance, watering the Ground well before planting, if the Weather be dry. In the same manner also must be sown and planted the *Savoy-Cabbages*, or *Savoys* (as they are called) for *Winter* use, for they are not good till the Frosts have pinched them. These and all other kinds of *Cabbages* will put forth Sprouts from the Stalks, that towards the Spring are even preferable to the *Cabbages* themselves, and will continue so to do till the Middle of *April*, about which time Greens of this kind are very scarce, and therefore young *Cabbage-Plants* and *Cole-worts*, that were sown in *July* or *August*, are then the only Greens, except *Spinage*, that we have recourse to.

When we have a right sort of *Cabbage* to our Mind, we may plant it for Seed in the following manner: In *January* make choice of the dryest Part of the *Garden*; and having stripped some full-grown *Cabbages* of their loose Leaves, plant them so deep in the Ground, that none of the Stalk appear above it, and then make up a Bank of Earth round about the *Cabbage* itself, so that none of it
be

be seen but the Top, from whence the Flower-stems will begin to break in *March* or *April*, and then must be staked up as the *Colly-Flowers*. The *Seed*, when it is full grown, must be gather'd, and order'd like that of the *Colly-Flower*.



CHAP. V.

Of the LEGUMES or PULSE, such as BEANS, PEASE, KIDNEY-BEANS, &c.

SUCH as design to propagate *Beans* or *Pease*, must have a large Parcel of Ground; for 'tis not a small Quantity will suffice to furnish a very moderate Proportion of them; more especially, because they should be sown at different Seasons: That from the Time they first come in, to the Beginning of *Winter*, we may always have a fresh Supply of young ones, as the former Crops decay.

SECT. I.

Of BEANS.

THE *Bean* has many Varieties; two Kinds of which I shall only make mention of, viz. the *Spanish Bean* for an early Crop, and the broad *Windfor Bean* for the *Summer*: The first of these are commonly put into the Ground in *November* or *December*, about five Inches apart, in
some

some well-exposed Place, commonly in a single Line under a *South Wall* or *Hedge*, to shelter them from the sharp Winds of the *Winter*; but I rather make choice of a *Hedge* than a *Wall*, for this Reason, that when the *Beans* are above Ground, and the *Frost* takes them, the *Wall* will, when it is somewhat warm'd by the *Sun*, thaw them and the Ground where they stand, till Night comes on, and then they freeze again; and so if the *Frost* lasts any time, they are continually harrafs'd in this manner, Night and Day, till they are destroy'd. But on the contrary, a *Hedge* shelters them from the sharp Winds; and not reflecting any Heat upon them in the Day, as a *Wall* will do, the *Plants* remain in the same frozen State, till a general *Thaw* releases them, without undergoing such violent Fits of Alteration, which must certainly impair their Parts.

If we have double Lines of these forward *Beans*, let not the Rows be nearer together than two Foot, for else they would smother each other when they come to grow up; and then, by running too much into *Stalk*, would produce but few *Blossoms* and less *Fruit*. It must be observed likewise, that if they have shot any considerable Length before the severe *Frosts* begin, they must be earth'd up within a little of their Tops; and in the Time of their *Blossoms*, cut off the Top of every *Bean-stalk*, to make them set their *Fruit* the better.

About *February*, we may set a second Parcel of Ground with *Spanish Beans*, to come in after the former; and in *March*, plant some *Windsor Beans* for the first time, for they are tender, and cannot bear the *Frosts*. I have experienced, that if we set the Rows about a Foot asunder, suffering them to grow till they are about five or six Inches

Inches high, and then cut down every other Line within two or three Inches of the Ground, we shall then have a double Crop of *Beans* from the same Sowing, one coming in about *July*; and that which was cut down, springing afterwards afresh from the Roots, will have *Beans* about *August* or *September*. 'Tis therefore I would advise, that if it should happen that two Crops of *Beans*, sown at different Seasons, should by accident tend to blossom at the same time, as they often do, cut down one of them to have a late Crop.

'Tis also necessary to set *Beans* in *April* and *May* in moist Places, and then they must be allow'd a greater Distance between each other, than those that were planted forwarder in the Spring; but above all, keep them clear of Weeds; and I think it would be good Husbandry to water them about the time of their Blossom, if the Season be dry. I have known likewise *Beans* planted in *June*, that have yielded a very good Crop late in the Autumn.

Beans love a stiff Soil, without any Manure: When their Seeds are full grown, the Plants may be pull'd up by the Roots, and set to dry in some well-exposed Place, and then thresh'd out for Use.

S E C T. II.

Of P E A S E.

THE Kinds of *Pease* which I shall mention, are the *Hotspurs*, for *Winter* Sowing; the *Dwarfs*, and the *Ronciwal*, or *Dutch Admiral*, to be sown in the Spring: These Sorts may well enough suffice for any *Garden*, without enumerating at least fifty other Kinds that I have heard of; which perhaps are so near a-kin to these, that the Difference can hardly be distinguish'd but in the

the Names only. I have often wonder'd at the Indiscretion of some People, who take delight in giving cramp Names to Plants, and make it their business to multiply Species without reason; as if a Fruit would be the better for a Name that could not be understood; or that the Works of Nature were not already numerous enough for us to contemplate: But to say no more of that vain Humour, which too many are subject to, I shall proceed to lay down what I have observed relating to the Culture of *Pease* in a Garden.

It is not one of the least Perfections of a good Gardener, if he has Ground enough to provide so many Crops of *Pease* every Year, as may furnish a Table throughout the whole Summer. About *November* or *December* is soon enough to sow the first Crop; for if they were put into the Ground sooner than those Months, they would be endanger'd by the Frosts. Some of the *Holspurs* are the most proper for that Season, to be sown in *Drills*, each *Drill* about two Foot from the other, the Lines running from *North* to *South*. When they have shot about six Inches high, earth them up about four Inches on both Sides of the Lines, raising a little Bank on the *East* Sides of them, to defend them from the *Blasts* which accompany the *East Winds*.

In *February*, a second Crop of the same kind of *Pea* should be sown; and in *March*, we may put in a third of the same Sort. About the Beginning of *April*, some Ground may be prepared for sowing some of the *Dwarf-Pease*, especially the very short Kind, which seldom rises higher than half a Foot, or covers more Ground than six or seven Inches square; and notwithstanding the Smallness of this *Plant*, it will yield near as many *Pease* as one of the largest Kinds, and those not inferior

to any in their Taste: These *Pease* should be set four or five Inches a-part, in Lines about eighteen Inches distant from one another, if they are design'd for Table-use; or if they are planted for Seed, the Lines need not be above a Foot a-part; for then there will be no occasion to go between them, till they are ripe enough to be pull'd up.

Besides this small Sort, there is another kind of *Dwarf-Pea*, which rises about a Foot high, a very good Bearer, and well-tasted: This Sort may be sown thicker than the former, because they carry their *Vines* more upright; but the Lines should be two Foot a-part. In *April* these may be sown, and in *May* or *June*, as well as the former, to have a constant Supply of young *Pease* following one another: The smallest Sort I have sown in Edgings, and have gather'd great quantities from them; and I think them much the best for *Hot-Beds*, if we covet *Pease* in the *Winter*, as they take up but little room, and afford a considerable Crop. I am assured, one *Bed* of them will yield as many *Pease* as three *Beds* of the same size sown with the common Sorts: For this end sow them upon a gentle *Hot-Bed*, the first Week in *September*, about five Inches a-part.

The End of *April*, or Beginning of *May* is a right Season for sowing the *Roncival* or *Egg-Pea*, which is also called the *Dutch-Admiral*: This is the most rampant of all the *Pea* Kind, therefore requires more room than the others: Sow them about two or three Inches a-part, in Lines, planting two Rows within eighteen Inches of one another, and then leave a Space of four Foot for an Alley to pass through when they are fit to be gather'd. Having allow'd this Passage, plant two Lines more, eighteen Inches a-part, and so continue to do,

do, allowing the Breadth of four Foot for each Alley, till the whole Piece is sown. When they are grown about six Inches high, earth them up like the others, and set two Rows of Sticks or Boughs about seven Foot high, to each double Line of *Pease*, for them to run up, and they will bear plentifully; which they never will do if they are set too close together, or are not staked up.

S E C T. III.

Of the *KIDNEY-BEAN*, or *FRENCH-BEAN*.

WE have two Sorts of *Kidney-Beans* common in our Gardens; the one which bears early near the Root, without running high, call'd the *Battersea-Bean*, and another Kind which is more rampant, growing near six Foot high, if it is staked up. Besides these, I have seen above fifty other Sorts that have been brought from foreign Parts, but seldom produce any quantity of Fruit in our Climate.

We sow *Kidney-Beans* the first Week in *April*, in a light, fresh Soil, making *Drills* from *North* to *South*, laying the *Beans* in them about four Inches a-part, and covering them with Earth, raised in a Ridge to keep the Wet from them; for if the Ground be over-moist, it rots them.

The Lines of the *Battersea-Bean* should be two Foot a-part, and the other Kind should be sown after the same manner as I have prescribed for the *Roncival Pea*, i. e. in double Rows, and Alleys between them two Foot and a half wide.

The *Battersea* Kind need not be staked; but the others will not bear well without they are staked.

staked. From the first Sowing in *April*, we may once every three Weeks, till the middle of *July*, continue to sow fresh Parcels of Ground with *Kidney-Beans* to succeed one another till the Winter comes in.

We must observe, that when the Ground is very dry, as in *June* or *July*, and the Weather likely to be hot, we must water the *Drills* as soon as we have opened them, before we put in the Seed, which will contribute to make them sprout ; but we must avoid watering them after they are sown, lest we rot them.

Out of Curiosity I have known some of the *Battersea* Kind of *Kidney-Beans* sown in *Hot-Beds* five Inches apart about the first Week in *September*, and they have had *Beans* fit to gather about *January* ; but these, as well as other *Plants* of this nature, when they are forced, must have all the Air that can possibly be allow'd them, or the *Plants* will be apt to decay.

The *Wing-Pea*, when it is very young, is by some dress'd and eaten like *Kidney-Beans*, but in my Opinion is not near so good ; the *Blossoms* indeed are of a beautiful Colour, and make a good Show in a *Garden*, if they are set in *Edgings* : It grows in any Soil without difficulty, if we put in the Seeds in *April*.



C H A P. VI.

Of SALLETS, their Culture.

AS the different Humours of Mankind will not allow me to prescribe any certain Mixture of Herbs as the most pleasant to the Palate, so I shall content myself with giving my Reader only some general Hints relating to the several Sorts of common *Sallet Herbs*, and leave every one to please himself in the Mixture of them.

I would have the Relish of the several Herbs consider'd; as for example, which are most hot and biting, as *Cresses*, *Mustard*, *Cellery*, *Taragon*, *Chervil*, &c. and the more cool and insipid to the Taste, as *Turneps*, *Rape*, *Spinage*, *Corn-Sallet*, *Lettuce*, *Purslane*, and such-like: By this Knowledge a *Gardener*, when he composes a *Sallet*, may so judiciously mix his Herbs, that the too strong Taste of one Kind will not over-power all the rest, and discreetly make use of the insipid Sorts to qualify the Pungency and Heat of the others, as the Season of the Year is more hot or cold; so that every *Sallet* we eat may not only be agreeable to the Taste, but also a sort of Physick to the Body.

I think where Seeds are used medicinally, one might raise young *Sallets* of them to be eaten with the common small *Herbs*, and have the same Effect as the *Seeds* themselves; but I shall now proceed to the Method of raising them.

S E C T.

S E C T. I. Of S M A L L H E R B S.

WHAT the Gardeners call *Small Herbs* in *Sallets*, are such as should be always cut while they are in the *Seed-leaf*; such are *Cresses*, *Mustard*, *Radish*, *Turnep*, *Rape*, *Spinage*, and *Lettice*; all these are commonly known to Gardeners, and are generally raised by them, from the Seeds sown in *Drills* or *Lines*, about a Yard in Length, in such an Exposure, as the Season of the Year requires; that is, from *Mid-February*, to the End of *March*, under Glasses and Frames; and from that Time, to the Middle of *May*, upon natural Beds of Earth, warmly exposed; and afterwards, as long as the Summer Heats remain, in more shady Places. About the Middle of *September* and *October*, make your *Sallet-Beds*, as I have advised in *February* and *March*; and then, as frosty Weather begins to come in, prepare moderate *hot Beds* to sow your *Sallets* upon, to be continued during the *Winter* Months; these should have as much Air as possible, as well to give them Colour, as to help their Taste. It sometimes happens, when the Frost is very violent, that the *Small Herbs* are frozen, notwithstanding the greatest Care, but I am told, That putting them into Spring-water for Two Hours before they are used, will recover them. I likewise find it is the best Way to draw the *Small Herbs* up by the Roots, from the *Hot-Beds*; for if the Roots are left in the Earth, when you sow a second Crop of *Salleting* upon the same *Bed*, it will not prosper. Also it should be observed, in sowing the second Crop, that Seeds of the same Kind, should not be sown in the same Place, but ease the Ground with

PART IV. X varying

varying its Burden, putting the *Seeds* of hot *Herbs*, where the cool ones grew before; and this ought always to be observed in the *Culture* of every *Plant*, that we do not place them immediately upon that Spot where the same Kinds have just been growing. The most skilful *Farmers* and *Gardeners*, observe this Rule with that Exactness, that it seems as if one Kind of *Plant* meliorated and prepared the Ground for the Reception of another.

For the greater Perfection of our *Winter-Sallets*, it would be well to sow some Lines of *Cresses* in the natural Ground, about the Middle of *August*; for they will resist the Frosts of the *Winter*, and help greatly to enrich our *Hot-Bed Sallets* with the high Taste they acquire, by being exposed in the open Air. Likewise at the same Time, sow a *Bed* of *Chervil* for *Winter* Use, as well to mix among our *Sallet-Herbs*, as to put in *Soops*, &c.

S E C T. II.

Of Sellery and Endive.

OUR *Winter Sallets* are likewise greatly improved by blanch'd *Sellery*, which is an hot *Herb*, of a very rich Flavour; it is raised from Seed sown in *March* and *April*, in light Earth, in some well-exposed Part of the *Garden*, and planted out about Six Weeks after it is come up, in Beds, allowing Four Inches Distance between the *Plants*; they may there remain till the Middle of *June*, at which Time, some of the first Sowing will be fit to plant in Trenches for blanching. The Trenches must be cut by a Line, Eight or Ten Inches wide, and about the same Depth, and as soon as they are made, put in your *Plants*, after having prun'd off the Tops and Roots of them: They

They must not stand nearer together than Five Inches, if they are strong; and as they grow large, earth them up within Four or Five Inches of their Tops, and so continue to do at several Times, 'till they are fit for Use. It is necessary to make Three or Four different Plantations of *Sellery* at several Times, one to come later than the other; and we may note, That these *Plants* will not be White 'till Six Weeks after they are earthed up; they love a light, rich Soil.

Endive, when it is blanched, is much used about *London* in *Winter Sallets*; though, in my Opinion, it is a Plant hardly worth our Trouble, as it has neither Taste nor Flavour: It loves a light rich Soil, and should be sown about the latter End of *April*, lest it run to Seed, as it is apt to do, if it is sown too early in the Spring. When it has been come up about Six Weeks, plant it in Beds as I have directed for the *Sellery*, and about the Middle of *July*, plant it in Rows, about Six Inches a-part; and as soon as it is well grown, tie up some of it to whiten; and every Fortnight, as long as it lasts, tie up fresh Parcels of it.

S E C T III.

Of the Cabbage Lettice.

WE have great Varieties of *Lettice*, many of which have been more esteemed for their Rarity, than for their Goodness; but of all that I have yet tried, I find none to exceed the good Qualities in the *Roman Lettice*, the *Dutch Brown Lettice*, and the *Imperial* and *Silesia* Kinds; all which Sorts cabbage extremely well, and are well tasted.

The *Brown Dutch Lettice*, if it be sown about the Middle of *August*, will be fit to transplant in *September*, to stand the *Winter*, either for cabaging early in the Spring, or to be cut for *Winter Sallet*; it loves a rich light Soil, and warm Exposure, as do all of this Tribe, especially if they are sown towards the Autumn. The *Imperial* and *Silesia Lettices*, if they be sown about the same Time with the former, and planted out in warm Places, will be very large, and be fit to cut very early in the Spring; but the *Roman Lettice* I have not known to bear the Frosts.

In *March* are commonly sown all these Kinds in the open Ground among other Crops, as I have already hinted elsewhere: And that there may not want a constant Supply of them, sow some every Month, from *March*, 'till you put in the *Winter* Crop, and plant them out in Beds about Five Inches a-part, Three Weeks after they come up; for transplanting them contributes to make them cabbage.

Such as produce large *Cabbages* early in the Spring, may be suffered to stand for Seed, and should be stak'd up, lest the winds annoy them; but the *Imperial* Kind will hardly run to Seed if the Crown of its *Cabbage* be cut cross-ways, and carefully open'd, to give Way for the *Flower-stem* to shoot; and then likewise the *Plant* will be in Danger of rotting, if it should rain, therefore fix a *Glass Bell* over it. The Seeds will be fit to gather as soon as they begin to shew their *Down*, and then pull up the *Plants*, and set them to dry in a *Green house*, 'till you find the *Seed* is fit to be thrashed out.

It is observable, That though the *Plants* we save the *Seeds* from were of extraordinary good Kinds, yet those *Seeds* will degenerate from the *Mother Plant*, if they are cultivated in the same
Garden

Garden where they were saved : Therefore, if you can possibly meet with an honest Correspondent, who gathers yearly the *Seeds* of such *Plants* as you have occasion for, change with him every Year, and you will both find your Advantage by so doing.

S E C T. IV.

Of Burnet, Corn-sallet, Purslane, Sorrel, Spinage, and Taragon.

THE Contents of this *Section*, will be of the Culture of certain *Herbs*, which are often used in *Sallets*, and serve as Additionals to those I have before mentioned. *Burnet* is a cool *Herb*, a perennial *Plant*, whose tender *Leaves* being mixed with other *Sallet-Herbs* in the *Winter*, give us the agreeable Flavour of *Cucumbers*. It is propagated by *Seeds* sown in *March*, and may likewise be encreased at that Time by parting the *Roots*.

Corn-Sallet is raised from *Seeds* sown any Time of the Year, and makes a very good *Sallet* Furniture in the *Winter*.

Purslane is an insipid *Herb* to the Taste, but very cooling, and is admired by some People in *Summer Sallets*: We have Two Sorts of it, the *Golden Purslane*, and the *Green Sort*, which are both raised from *Seeds* sown in some warm Place in *April*; or may be sown earlier, if they have the Help of *Glasses*.

Sorrel is also used in *Sallets* especially in the Spring; the young *Leaves* are very agreeable; it is raised from *Seeds* sown in *March*, commonly in Rows or Drills.

Spinage I have already mentioned to be one of the necessary Ingredients in raw *Sallets*, to be

cut in the *Ear-leaf*; but it is of far greater Use for boil'd *Sallet* in *Winter* and the *Spring*. The Beginning of *August*, it should be sown in some Place well expoed to the Sun, that the *Leaves* may be large enough to cut for boiling in the *Winter*; and in *March*, *April*, and *May*, we must not fail to sow several Parcels of Ground with it at different Times, about a Fortnight distant from one another, to supply the Table constantly, 'till other Greens are plenty; for in the Spring one Crop will hardly last good longer than a Fortnight, without running up to Seed. We have Two Kinds of it. The *prickly* Sort, and the *Round Spinage*, differing in the Shape of their Seeds, according to their Names; but I find no Difference in their Taste when they are boiled.

Taragon, of all other Herbs, should not be wanting in a *Sallet*, as it is a Cordial Herb, tho' the Taste of it may not perhaps be so grateful to the Palate at first, as the common Herbs: For my own Part, I think it pleasant, if there is not too much of it; a few Leaves, or Three or Four of the tender Tops, are enough to give a *Sallet* an agreeable Relish. This *Plant* loves a warm Exposure, and is propagated from Slips taken from the Root, and planted in *March*.

In the Spring, *Dandelion* blanch'd, which may be gathered almost in every plough'd Field, is an excellent *Sallet*, being mixed with other Herbs. Some likewise gather *Violet* Flowers, *Cowslips*, and the Blossoms of *Burrage*, as Part of their *Sallet* Furniture, and in the *Summer* the Flowers of the *Nasturtium Indicum*. In short, whoever is once acquainted with the different Flavours of the several Herbs I have named in this Chapter, may easily please himself with a *Sallet*.

N. B. Whatever Seeds are sowed or gathered, must be well dry'd and ripen'd before they are thrash'd

thrash'd out; and then, after cleaning them, must be expos'd to the Air and Sun for a Week at least before they are laid up, otherwise they will mold and rot.



CHAP. VII.

Of POT-HERBS, and such as are commonly used for Distilling.

THAT I may not omit any thing that is proper to be done in the *Kitchen-Garden*, I propose to treat of such *Plants* and *Herbs* in this Chapter as are commonly used for *Distilling*, and are sometimes dry'd for the Use of the *Kitchen*; and, first, such as are *Aromatics*.

Rosemary and *Lavender* are both durable *Plants* and *Ever-greens*; they love a light sandy Soil, and are both raised from Slips planted in *April*; quickly taking Root if they are Shoots of the last Year, but will not grow if they are older: They are apt to suffer by the Frost, especially if they have too much wet, and therefore should be planted chiefly in the dryest Parts of the *Garden*, where they may be the most expos'd to the Sun. *Lavender* makes a fine Edging in large Walks, if it be often clipp'd; but for the sake of its *Flowers*, which are often used, we must have a Plantation of it a-part; for were the Edging *Plants* suffered to flower, their Beauty would be spoiled.

Thyme and *Hyssop* are either raised from Seeds sown in *March* or *April*, or propagated from Slips planted in those Months: We have many Sorts of *Thyme* of various Scents and Uses; the *Pot Thyme*,

Lemon Thyme, and a Sort with variegated Leaves, are most commonly cultivated, and make very good Edgings that will last seven or eight Years: And beside them the *Mastick Thyme*, and the *Marum Syriacum*, or *Cat Thyme*, are cultivated in many *Gardens* for the Sake of their refreshing Odour; but the latter, if it is in small Quantities, must be carefully defended from the *Cats*, who love to eat it, and are intoxicated with it; but I observe, where it is in Abundance, the *Cats* never disturb it. These two last Kinds should be planted in the warmest Parts of the *Garden*, the others will grow any where.

Sage has many Varieties, but we propagate only three Sorts of it, viz. The *Red Sage*, the *Tea Sage*, or *Sage of Virtue*, and the *Wormwood Sage*; these Kinds are raised from Slips taken from the Roots about the beginning of *April*, and planted a Foot a-part in light Earth. The *Sage of Virtue* should be cut for drying when it is full of young Shoots, for those only are fit to make *Tea* of; they should be gather'd in a dry Day, about Noon, and laid to dry in the Shade to be preserv'd for Use. I have been often told, that the *Wormwood Sage* is preferable to the former, affording a pleasanter Liquor, and more grateful to the Stomach.

We seldom meet with more than two Sorts of *Rue* in our *English Gardens*, and their Difference only consists in the Colours of the Leaves; the one being variegated with Cream Colour, and the other of a plain Green; This *Plant* delights in shady Places, and is easy multiply'd by Slips set in *April* in a light Soil. In Times of Pestilence this *Plant* has been much in Request, on a Belief that it prevents Infection.

Mint, or *Mentb* and *Baum*, should neither of them be wanting in a *Kitchen Garden*; they are propa-

propagated by parting their Roots any Time in the Spring, and will grow any where. *Mint* indeed is more generally cultivated than the other, as it is of itself a pleasant *Sallet*, and good in *Soops*, and some *Sauces*, besides its extraordinary Use in *Distilling* : When it is about a Foot high, it should be cut to dry in *Bunches* for *Winter* Use ; observing this, as a general Rule, To cut every *Herb* design'd for drying, in a dry Day, and then to dry them in the Shade.

Some *Gardeners* think it worth their while to plant some large Roots of *Mint* in the Corners of their *Hot-Beds* about *November*, that they may have young *Shoots* of it to mix among their *Winter Sallets*.

Tansie is increas'd by parting the Roots in the Spring, and is a *Plant* so valuable, that it must not be wanting ; some of it should always be kept dry in the *Winter*, especially for the Use of those who are afflicted with the *Gout* in their *Stomach* : It is of that sovereign Efficacy in that Case, as I have found by Experience, that I think I should be guilty of ill Nature, if I was to pass by this Opportunity of making known the Method of using it. Boil half a Handful of this *Herb* in half a Pint of strong *White Wine*, and drinking this Decoction as hot as possible, I have always found it to remove the Pain in less than a Quarter of an Hour.

Wormwood is either raised from Seeds or Slips planted in *March* ; it will grow in any Soil, and be apt to over-run the Ground, if it be eaten by Hogs when the Seeds are ripe, which passing through their Bodies, germinate, and come up very quickly.

Penny-royal and *Cammomile* are useful *Herbs*, and very well deserve a Place in the Garden ; they delight in moist shady Places, and prosper best in a stiff

a stiff Soil ; they are both propagated from Slips planted in *March* or *April*.

We have two Kinds of *Marjoram* commonly propagated in *Gardens* ; one Sort called the *Winter Sweet-Marjoram*, which will resist our Frosts, and remain good two or three Years, without renewing, and the other is sown annually upon the *Hot-Bed* in *March*, not being able to defend itself from the Violence of our *Winters*: The first Kind is increased by planting the Slips about *March* or *April* in moist Places, but has not that agreeable Scent which we find in the other ; therefore some of the last Sort should be dried every Year when it is grown pretty large.

Carduus is raised from Seeds sown either in the Middle of *August*, or in *March* ; but I commend the Autumn *Plants* before those raised in the Spring, as they are much larger, and more vigorous than the others, and, besides, have a much better Season to dry in.

Angelica is raised from Seeds sown in *March* in a moist rich Ground ; it is a *Plant* that lasts good for several Years without renewing, and is of great Use.

Dragons ought also to be found in our *Garden*, as well for the Beauty of the *Flowers*, as the Use made of the whole *Plant* in many Cases ; it is multiply'd by transplanting the Suckers taken from about the Root in *March*: This *Plant* loves a fresh natural Soil and Shade.

Fennel and *Dill* are both propagated alike from Seeds sown in the Spring ; they are useful *Herbs*, and should not be wanting in a *Garden* ; the first, having its tender Stalks blanch'd like *Sellery*, makes a very good Sallet.

Parsley and *Clary* are also very useful Furnitures of a *Kitchen Garden* ; they are both cultivated with great Facility, and raised from Seeds which should

should be sown in the Month of *March*, and renewed every Year.

I have now (I think) mentioned every *Plant* that is required to grow in a *Kitchen Garden*, and would advise, That the several Kinds I have treated of in this Chapter, be planted in some Place near the House, for the Conveniency of gathering them with little Trouble when they are wanted.



C H A P. VIII.

Of ENGINES for raising of WATER, with some Observations and Experiments for the meliorating of Water for the Use of Gardeners.



S it is impossible to have either a fine or profitable *Garden* without the Command of good *Water*, I am persuaded this Chapter will not be unacceptable to such Gentlemen as have their *Gardens* unfortunately situated remote from it; but especially if by the Assistance of some *Engines*, which I shall here mention, they may be taught how to bring it, with little Trouble, to their Houses or Gardens, although they have their Station upon the Tops of Hills, or other Places remote from *Water*.

First, Supposing the Situation of the House or Garden to be a considerable Height above any Pond, River or Spring, and that it has, at present, no other Conveniency of *Water* than what is brought continually by Men or Horses to it: In this Case, the wonderful Invention of the late Mr.

Mr. *Savory*, F. R. S. for raising *Water* by *Fire*, will not only supply the Defect, by flinging up as much *Water* as may be desired, but may be maintained with little Trouble, and very small Expence. It is now several Years since Mr. *Savory* set up one of them for that curious Gentleman, Mr. *Balle*, at *Cambden-House*, which has succeeded so well, that there has not been any Want of *Water* since it has been built; and with the Improvements which I have since made to it, I am apt to believe will be less subject to be out of Order, than any *Engine* whatever.

For the Satisfaction of the Curious, I have given a Design of it, Fig. I. of the second Plate, agreeable to that at *Cambden-House*, which is, I think, the truest porportioned of any about *London*: The several Parts of it, and the Manner of Working it, I shall explain as follows.

- A The *Fire*;
- B The *Boiler*; a Copper Vessel of a spherical Figure, in which *Water* is boiled and evaporated into *Stream*, which passes through
- C the *Regulator*, which opens, to let it into
- D The *Steam-Pipe* (of Copper) through which it descends to
- E The *Receiver*, which is a Vessel of Copper, that at first setting at Work is full of Air, which the *Steam* will discharge through
- F The *Engine-Tree*, and up the *Clack* at
- K (The *Plug* of the said *Clack*, to come at and repair the same, if need be) and so the Air goes up
- L The *Force Pipe*.—After E is void of Air; which is to be found by its being hot all over then stop the *Steam* at C, and throw a little cold *Water* on E, and the *sucking Clack* will open at

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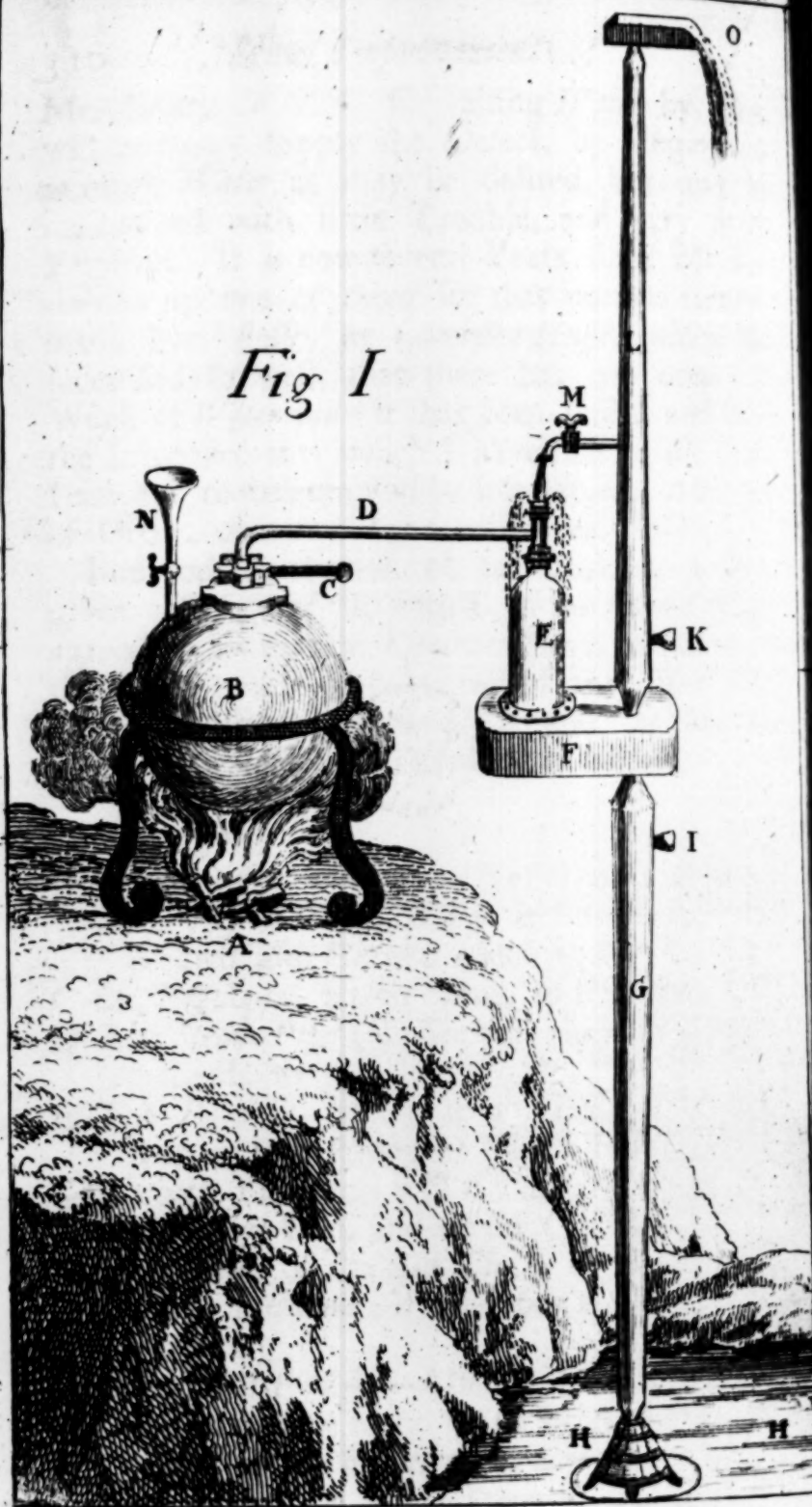
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Fig I



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Fig. II.

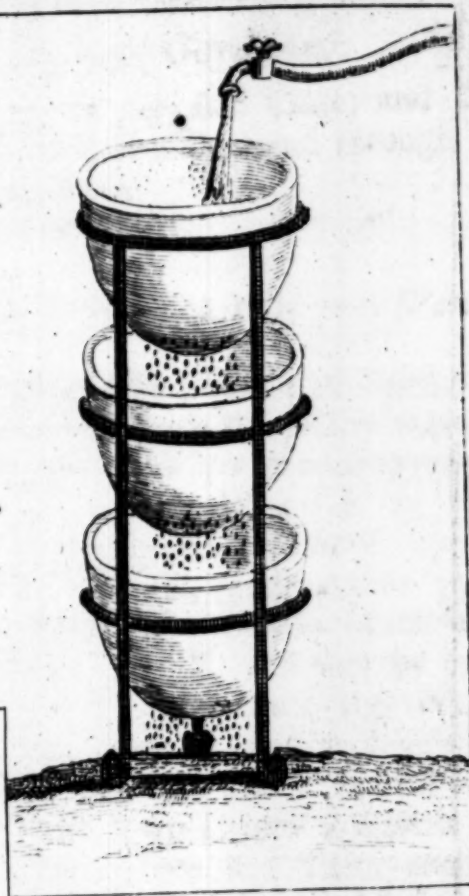
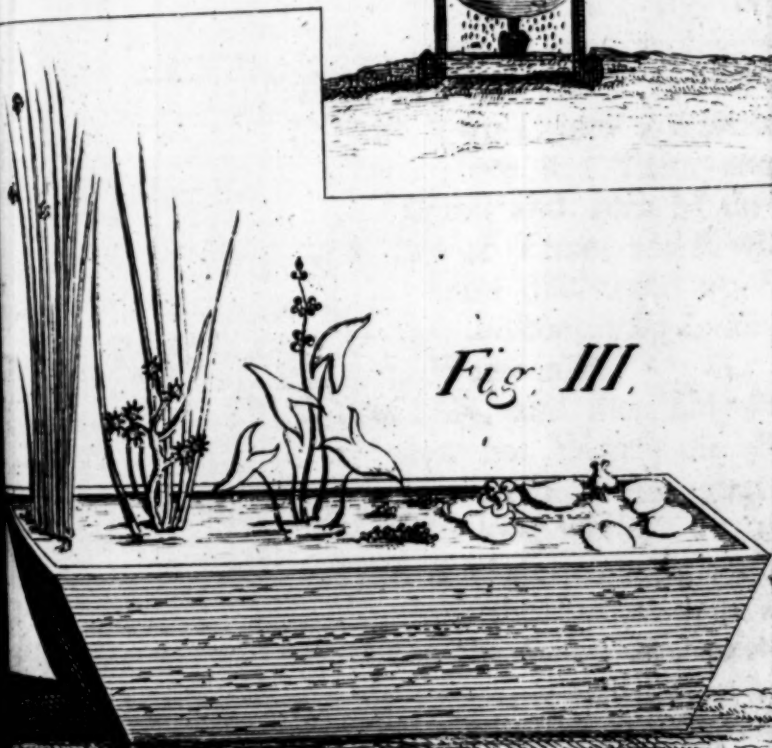


Fig. III.



I (Which

I (Which is the *Plug* of the said *Clack*) and fill
E with Water, which will ascend through
G The *Sucking-Pipe*, from
A The *Pond, Well, or River*.

This being done, proceed to raise your *Water*,
viz.

First, Turn C to let the *Steam* pass from the
Boiler into E, and it will force the *Water* therein
thro' F by K up L, which *Water* cannot descend,
because of the *Clack* at I. When E is thus
emptied, which may easily be perceived by its
being hot as before, turn C, and confine your
Steam in B; then open the *Cock* M, which will
let a little cold *Water* into E, and that by con-
densing the *Steam* in E, will cause the *Water*
immediately to ascend from H, and replenish E.

Then turn C to let the *Steam* into E, and it will
force the *Water* out of it up L into a *Cistern* O,
placed at the Top to receive it. Then confine
your *Steam* at C, as before, and turn M for the
Space of a Second or two of Time, and E will be
refill'd, which may be again discharged up L as
before: So this Work may be continued as long as
you please, if you keep *Water* in B.

If you turn the *Cock* N, and then only *Steam*
comes out of it (without hot *Water*) the *Boiler*
must be replenished with fresh *Water*; but one
Boiler of *Water* will last a long while.

When you have raised *Water* enough, and you
design to leave off working the *Engine*, take away
all the *Fire* from under the *Boiler*, and open the
Cock N to let out the *Steam*, which would other-
wise (were it to remain confined) perhaps burst
the *Engine*.

The Proportion of the several Parts of this
Engine, as it now stands at *Cambden-House*, is
thus:

The

The *Pipe*, from the Surface of the Water to the *Engine Tree F*, is sixteen Foot, which is the Length it sucks the Water (but might be made to draw Water about twenty-eight Foot.)

From the *Engine Tree F*, up to the great *Cistern*, which receives the Water, is forty-two Foot (but might be an hundred Foot high, if such a Quantity of *Steam* be allowed as is proportionable to the Length of the *Pipe*.)

The Diameter of the Bore, as well of the *Sucking Pipe G*, as of the *Force Pipe L*, is three Inches; and of the *Steam Pipe D*, about an Inch.

The *Receiver* holds thirteen Gallons of Water, and the *Boiler* three times that Quantity.

When this *Engine* begins to work, you may raise four of the *Receivers* full of Water in one Minute, which is fifty-two Gallons; and at that rate, in an Hour's time, may be flung up Three thousand One hundred and twenty Gallons, which is above Eighty-six Barrels: Or if there were two *Receivers*, one to suck, while the other discharged itself, as has been practised, then we might raise Six thousand two hundred and Forty Gallons in the same time.

The prime Cost of such an *Engine* is about fifty Pounds; and the Quantity of *Coal* required for each Working, is about half a Peck; so that the Expence will be very inconsiderable, in comparison to what the Carriage of Water upon Horses would amount to; and in such Countries where Wood is plenty, the Expence would be much less.

Now if the Quantity of Water which is here said to rise in an Hour's time, may not be thought enough for the Use designed, the same *Engine* may either be continued to work for four or five Hours, or another of a larger Extent might

might be set up. I have seen one with two *Receivers*, which held each of them a Barrel (*i. e.*) Thirty-six Gallons of Water, which would furnish so great a Quantity, that even some tolerable large Fountains might be supply'd by it.

In the working this *Engine* we may observe two Things which contribute to explain the Motion of the *Sap* in *Plants*; *First*, We discover the violent Elasticity of *Steam* or *Vapour*, when compress'd or crouded into a little Room, as the *Steam* or *Vapour* rising from the Roots of Plants into the fine *Tubes* or *Vessels* in the Wood, has sufficient Force to *unroll* or *explain* them at their Extremities, and by that Means to enlarge the Plant. *Secondly*, We may observe the Effect of cooling this *Steam*; it then *condenses* or *thickens* into Water, which I suppose it does in *Plants*, as soon as it reaches their extream Parts and meets the Cold, and then returns to the Root through other Passages big enough to receive it, by means of its own Weight.

The *Persian-Wheel* is another *Engine* which will draw Water from any great Depth: It is much used in *Italy* and other Parts of *Europe*, for drawing Water out of deep *Wells* and *Mines*. This *Wheel* has a Chain of Buckets, which in the Time of Working are continually filling and emptying themselves: Some of them going down while the others are coming up, the Chain being loose like that upon the Wheel of a *Jack*. This I should farther explain, if it was not so generally known to every one that has been abroad.

As for other Inventions for the same Purpose of raising Water, I shall refer my Reader to the *Engines* themselves; that at *Windfor-Castle*; the Engine at *Hampton-Court*; but above all others that I have yet heard of, for ingenious Contrivance, the *Engine* belonging to ——— *Louder*, Esquire,

Esquire, of *Whitehaven*, which I am told is a considerable Improvement upon Mr. *Savory's* Invention.

When by the Assistance of any of these, or other *Engines*, the Water is brought up to the Place design'd, it should be expos'd to the Air as much as can be in a Pond, or other Receptacle of the like Nature, which is capable of containing a large Fund of Water, by which means it will be kept from fermenting so quickly as it would do in small Quantities, confin'd in *Cisterns* of *Lead* or *Wood*; and if it should then happen that the Water is not palatable, or very fit for Household Use, it may be remedied by some of the following Ways.

If it be muddy, or ill tasted, the Water immediately fallen from the Pipe of the *Engine* into the *Pond* or *Receiver*, should first light upon a Bed of *Pebble-stones* three or four Foot thick; and the *Pond* or *Basin* it is receiv'd into, after it is prepared to hold Water, should be covered at the Bottom with the same kind of Stones. In that Part of the *Pond* where the Pipes receive the Water for its Conveyance to the House, should be laid a Heap of the same Stones over the Mouth of the Pipe; and at convenient Distances in the Course of the Pipes from the *Pond* to the House, should be made two or three small *Cisterns*, sunk a Yard in the Ground below the Pipe, fill'd with the same Sort of Pebbles; and this Method will purify the Water to an extraordinary Fineness. The famous *Pisa* Water, so noted in *Italy*, is not without these Helps; but indeed it is observable, that the very Mountain it springs from produces those *Olives* which make the sweetest Oil in the World, which probably proceeds from the Nature of the Soil, as the Goodness of the Water also is partly owing to it.

But

But for want of these Conveniencies, we may refine Water another Way, as it is frequently practis'd in *Spain*: They filter it through several *Bells* or *Basons*, made of a porous Stone of that Country, somewhat like those dug about *Oxford*. These *Basons* are placed one over another, as in *Fig. II. Plate II.* sometimes five or six, to make the Water as fine as you desire; but for want of these, I think we might use large *Basons*, of some sort of Earthen-Ware made in *England*, and baked, without Glazing, which will let the Water pass as freely as the *Bells* of *Stone*.

If it is too harsh, soften it with *Chalk* and *Gravel*; but above all we must observe, that no Water-Fowl be suffered to come near it, nor any Weeds or Fish live in it; and also that it is not annoy'd by Leaves of Trees falling into it.

And these Directions, I think, are not contrary to Reason, if we consider, that the best, and the worst Water, are only good or bad, according as they are filtred thro' *Beds* of different kinds of Earth; all Waters certainly partaking of the Qualities of the Earths they pass through, as it were by Infusion: It would, therefore, be well to observe, what Soils the best or most pleasant tasted Springs run through, that others may be regulated by them: From such Observations, an ingenious Man might easily alter the Taste and Quality of any Water, according to his own Fancy.

But for the Use of *Gardens*, the most pleasant clear Water is not to be preferr'd, nor such as comes immediately from a cold Spring; neither should it be harsh, but rather soft and muddy; A stagnating Water, that lyes well exposed to the Sun, seems to be the best for the Health of any Plant; or pure Rain Water, if it can be had without any Mixture; for all inrich'd or fatten'd Water

with Dungs, or other forcing Ingredients, proves often fatal to Plants, if not rightly understood ; and at the best, can only contribute to make a Plant grow something the quicker ; and such forcing of Nature always proves of ill Consequence, as well to Plants, as to Animals, by shortening their Lives.

Indeed, where we have to do only with annual Plants, it may be of Service, to use sometimes these Provocatives, the better to bring them to Perfection within the Compass of our *Summer* ; but then they must be apply'd considerately, and a right kind of Mixture prepar'd for each respective Sort of Plant : For we must not imagine, that one sort of Mixture, however fattening it may be, will alike contribute to the Welfare of every sort of Plant. I have experienced, that the black Water taken from a Dunghil, will make a *Cabbage*, or any of that Race, prosper extremely : But having used the same Water to other Plants, that were Aromatick, and whose Texture of Parts was more close, such as *Myrtles*, *Thyme*, and the like, it killed them very quickly ; which shews, that *Gardeners* ought not to confide in the Richness of any one particular kind of Water, for the Welfare of every sort of Plant, no more than a skilful Physician, will prescribe always the same Medicine, for the Cure of all sorts of Distempers.

But there is another thing to be considered in the preparing of Waters for Plants, which as yet seems to be very little regarded ; and that is, when we mix *Pigeons-Dung*, or other such-like Ingredients in Waters, we must allow them due Time to ferment, before we use them, otherwise they will injure the Roots we water with them, and that will distemper the Plants, and it may be will kill them, as we often find by Experience.

Mr.

Mr. Evelyn very justly observes, speaking of these Mixtures, that they should not be used, till they be sufficiently sweetned and purged from their own *Acrimony*: I have known many Plants destroyed by the Use of unripe Mixtures, although the same Preparations, when they have been fully matured, have done Wonders in forwarding the Growth of the same kinds of Plants: And again, the Proportions of every Ingredient ought to be as reasonably consider'd, and not to double our Quantities over hastily, because a moderate Proportion has already began to shew its good Effects; like some unthinking People, who believe, that the more Physick they take, the more healthful they shall be, because they have once been relieved from Sickness, by a small Dose of it: But a few Observations to an ingenious Man, who loves a *Garden*, will soon bring him to rights in these Matters.

I find that for *Orange-Trees*, *Sheeps* or *Deers* Dung steep'd in Water, about half a Bushel to a Hoghead, is of great Use, and may be fill'd up five or six times, without renewing the Dung; but this Water must not be used 'till it has stood at least three Days in the Sun, for the first Time, and about Forty-eight Hours for the others: And besides, we must likewise be sure to observe, that when we have once begun to make use of it, it must constantly be continued, or the Trees will decline.

I confess, I cannot from Experience, direct any other prepared Water for the Welfare of any particular kind of Plant, but the *Orange-Tree*; but, so far as I can judge, those Plants with the largest Vessels, will best endure the fattest Waters: See the Mixtures I mention for forcing Vegetation, in the Third Chapter of my First

Part of this Work, and infuse them in Water for Trial.

But to return to plain Water, which is the most natural to Plants; Use only such, if possible, as has stood in the Sun some Days to soften, either in *Cisterns*, or Pits dug in the Ground: but I esteem Pits to be the best; and even Water of this kind, should not be unheedingly given to Plants. We should then consider the most proper Seasons of doing it, and the best Method of refreshing Plants with it.

First then, we ought to water all Plants in the Morning, in such Seasons when the Nights are frosty; and in the Evening in the warm Seasons: The Reason of the First is, That too much Wet lying about the Roots of Plants, chills and pinches them so much, if it happens to freeze, that they often perish; but if it be given in the Morning, when there is likelihood of a warm Day, it gives the Plants such Nourishment as they require from it, and is dry'd up before the Frost of the Evening can have Power over it; therefore Morning Waterings should be in *August*, *September*, and *October*, *March*, *April*, and the first Fifteen Days in *May*; and from that Day to the middle of *August*, chuse the Evenings for the same Work, because then the extreme Heat of the Sun, would overheat the Water given in the Morning to the Plants, and scald their Roots, besides drying it up too quick, before the Plants could receive due Nourishment from it: But we should never use these Evening Waterings after the Sun is down, without great Necessity.

But in either of these Waterings, we should take Care to water as near the Ground as can be, and not hold the *Watering-Pot* too high, for that would wash the Earth from about the Roots of the Plants, and contribute to make the Ground
hard,

hard, when the Sun comes to shine upon it, and so bind the Roots too much. Before you water, observe always, that the Earth be open and loose about the Roots; and, above all, avoid, as much as can be, the wetting of the Leaves; for if the Frost comes upon them before they dry, it pinches and rots them; and if the Sun shines hot upon them while they are wet, they will spot and change their Colour.

Besides these simple Waterings, *Colly-Flowers*, *Cucumbers*, and those Plants which have large Vessels, should be floated; that is, the *Alleys* between the Rows should be dam'd up at each End, and fill'd with Water; and one of these Floatings will do more good, than six Waterings close to their *Stems*; they feed and nourish the extreme *Fibres*, which alone want his Help, and put the Earth in that Condition, that the smallest Warmth of the Sun will evaporate the Steam from it, which I account to be so necessary to plump the parenchymous Parts of the Leaves and Stalks.

It is a Rule to be observed in watering of Plants, that while they are not growing, they should be kept as dry as possible, and at the Time of their Growth, they should never want Water, giving them frequently a little at a Time, and chiefly at the Time they are in Blossom; for if by Accident of Weather, the Water lyes long about the Roots of Plants, it chills them, and checks their Growth. It is also to be observed, that such Plants as are very succulent or juicy, as *House-Leek*, &c. must have little Water; they contain Moisture enough in themselves for their Nourishment, and feed chiefly upon the Air, which they imbibe and condense in their spongy Parts; and besides, for their Substance, they have fewer *Sap Vessels* than any other kinds of

Y 3

Plants;

Plants ; therefore, I have laid it down as a Rule, in my *History of Succulent Plants*, and 'tis from Experience, that the more succulent any Plant is, so does it require less Water ; and so those Plants that have the greatest Proportion of *Sap Vessels*, and the least of spongy Parts, require frequent Waterings, which we find to be true from common Experience in the *Garden*, and by examining the Structure of *Water-Plants*, such as *Willows*, &c. which are for the most Part composed of *Sap Vessels*, and are, therefore, so tough, that they may be wrought into any Figure without breaking ; but all juicy Plants are brittle for want of these Vessels.

I believe, if we were to examine with the *Microscope*, the Numbers and Sizes of the *Sap-Vessels* in every sort of Plant we have a mind to propagate, we might come to a Certainty of the Proportion of Moisture every Plant required.

Since I have now given my Remarks upon *Water*, and the manner of using it in *Gardens*, I believe it will not be unacceptable to the Curious, if I give them an Account of the Method I have used to propagate *Water-Plants*, in *Pots* and *Cases*, which hitherto I believe has not been practised in *England*, by any but myself, and is what I find to succeed very well.





C H A P. IX.

Of WATER-PLANTS, *whether* Domestick
or Foreign, the Manner of propagating
them in our Gardens.



IN the First Part of this Work, I have taken some short Notice, that we have *Terrene Plants*, *Amphibious Plants*, and *Aquaticks*; but I shall now be more particular concerning the latter, and endeavour to shew how far the right Disposition of each of them ought to be consider'd, when we are about to propagate them. I am persuaded, many curious Persons would have made Plantations of *Water-Plants* in their Gardens long since, if they had known how to have done it, as the beautiful *Flowers* of some of them at least equal, if not surpass, many of our most curious *Land-Plants*, and that chiefly in the *West-Indies*; altho' *England* has also its Share, witness the *Water-Lillies*, and *Ranunculuses* of different Kinds, so frequently found in *Rivers* and *Ponds*.

Now that *Water-Plants* may have their Place in *Gardens*, even although there are neither *Ponds*, *Rivers* or *Springs*, to plant them in, I shall recommend the following Method, which I have experienced with good Success. First, provide either large *Garden-Pots* glazed within-side, and without Holes in their Bottoms, or else cause some Troughs of Wood to be made, according to the third *Figure*, *Plate II.* of *Oaken Boards*, about two Inches thick; such Cases should be six Foot long, two Foot wide at the Bottoms, and

two Foot and a half deep, if they are for large *Plants* that grow under Water, or shallower for such as do not require deep Waters; the Corners and other Joints of such Cases, should be strengthen'd with Iron, the Insides well pitch'd, and the Out-sides painted. In these *Pots* and *Cases* put common unmix'd Earth, so much as to fill one third Part of them, for *Water-Lillies*, *Pond-Weeds*, or such others as require Depth of Water for their Leaves and Branches to swim in; and fill about two Thirds of them with the like Earth for *Water-Plantains*, *Water-Aroms*, and *Ranunculuses*, which love less Depth of Water than the former; then for those *Plants* which grow in *Marshes* and *Bogs*, the Earth may lye within five Inches of the Top. This Work may be done in *April*, when the *Water-Plants* begin to appear, which may be brought in and planted from that Time 'till the middle of *June*, filling up each *Pot* or *Case* with Water as soon as the *Plants* are put in them. It must be observed likewise, that many of the *Water-Plants* are Wanderers, without taking any Root in the Earth; such as the *Water-Soldiers*, *Frog-Bits*, and *Ducks-Meat*, which swim about from Place to Place, as the Wind carries them, and only strike their Roots into the Water; therefore, a small Quantity of Earth at the Bottoms of the *Pots* they are set in, will suffice to maintain the Water in a right State for their Support. In a word, to observe the Mode of Growth, and the Exposure of those *Plants* we collect, will best help us to understand the right Way of cultivating them with Success, when we are about to civilize them in our *Gardens*; where in all Things the plain Road of Nature should be followed, or at least kept in View, if we desire healthful Plants.

I find that in this artificial Management of *Water-Plants*, those of *Rivers* should be frequently refresh'd with Spring-Water, and such as delight to grow in standing *Pools* or *Ponds*, to be seldom interrupted with it. It is also observable, that *Water-Plants*, upon removing them, will be as long before they recover themselves, to renew their Growth, as *Land-Plants*, which may seem strange to some, who are used to see the sudden Refreshment of a decay'd *Land-Flower*, when it is put into Water. And whereas it is a common Thing, to shelter *Land-Plants* from the Heat of the Sun after transplanting, *Water-Plants* must be dealt with directly contrary, and be exposed to the Sun after they are removed.

The *Seeds* of *Water-Plants* are of two Kinds, one Class always swimming on the Top of the Water, and the other sinking to the Bottom, as soon as it is shed, following the Nature of their Mother Plants in that respect: For if the Seeds of those Plants, which naturally swim on the Top of the Waters, should sink to the Bottom, such Seeds would then be removed from the proper Station requir'd for their Growth, and would therefore perish: And so likewise the Seeds of those Plants, which Nature directs to grow under the Water, will not swim on the Top of it. As for the Preservation of their Seeds, to supply us with several Kinds from Year to Year, which, without doubt, will produce as many Varieties, as the Seeds of *Land-Plants*, I shall prescribe the following Method, which may be useful for the Transporting them from remote Parts, or foreign Countries, which may be done more easily in Seeds, than in Plants already grown.

In order to save the *Seeds* of these Plants, we have no more to do, than to follow them from the Flower 'till they are ripe, and then to put them in
Earth

Earth and Water, to preserve them from Vegetation the Spring following, for Nature takes that Way, and in this there is no Difficulty. The *Pots* and *Cases* I have already directed, are proper to put them in as soon as they are gathered; then let them sink or swim in the Water 'till the Spring causes them to sprout, they will prosper with little Attendance; but, indeed, if we can be happy enough to meet with an ingenious Correspondent in any Part of *America*, where the Waters so generally are adorned with beautiful *Plants*, we must contrive some particular Method to preserve them during their Transportation; and for their Culture when we receive them, such as putting them (each Sort by itself) in Bottles of Water and Earth, with large Mouths, covered only with Linen Cloth, and not with Corks, which would cause a Ferment in the Liquors; place those Bottles in some Vessel of Water, 'till they can be brought to us, and then sow them in the Pots, prepared as I have already directed, for *Plants* of this Nature, and place them in *Hot Beds*, 'till the Weather with us will nearly answer the Heat of the Climate they came from. At the gathering their *Seeds*, strict Observation should be made of the Depth of Water they grow in, the Situation, the Quality of the Soil under the Water, and whether they inhabit running or standing Waters; and above all, the Taste of the Waters they grow in, whether salt, brackish, or fresh, should be observed: By such Instructions, I think it will be impossible to fail of the Success we desire.

When we have collected a sufficient Variety of *Water-Plants* into our *Gardens*, we may prepare to dispose them in *Classes*, and range the several Tribes in proper Order, which would be very useful to such as read *Lectures* on Plants; for indeed, the Want of some such Way as this, for the cultivating

cultivating of *Aquaticks* in a narrow Compass of Ground, has given the Students in *Botany*, the greatest Trouble in their Studies, and has been the Occasion that *Water-Plants* are so little known. The most proper Season for disposing and removing them, is as soon as they are out of Flower, and the Leaves begin to decay, which is about the Beginning of *September*; their *Stems* or *Branches* must then be cut off near the Root, and their Roots planted at due Distances, in the *Pots* or *Cases* already described.

The *Water-Lillies*, which I so much commend for their Beauty, are of several Kinds, the *Double White*, the *single White*, the large *single Yellow* flowering Sort, and the *small Yellow*. And beside these, I have heard of other Sorts of them in *England*, but have not yet found them; the large Kinds blossom in *June* and *July*; that with the yellow Flower somewhat sooner than the others: We may find them in quiet Waters, as in a *Pond* at the Back of *Twickenham*, where I have gather'd three Sorts; but the yellow Sort especially, is very plentifully in the River of *Thames*, about *Brentford*, where there are many other pretty Sorts of *Water-Plants*.

In the Ditches about *Lambeth*, and near the *Neat-Houses*, *Westminster*, I have observed great Varieties of *Water-plants*, as also near *Hampstead*, and upon the Banks of the *Thames*, over-against *Greenwich*; but I am told, there are not in any Place in *England*, so many different Species as in *Cambridgeshire*, which abounds so much in curious *Plants*, that the famous Mr. Ray, thought it worth his while, to compose a Volume, on purpose to describe the Plants of that County only. So that such as covet to propagate *Water-Plants*, may easily stock themselves with Varieties enough, which I shall never believe are less useful or beautiful,

tiful, because they are not so high-priced, as many others.

I shall now say little more upon this Head, unless it be, that we must shelter such *Water-Plants* as we receive from foreign Parts, in the *Green-House*, during the Winter ; for it may be, in that Season they will flower with us ; if they, like the *Exotick Land-Plants*, preserve so far their natural Season of Growth, that they will only sprout in the Spring-Time of their native Countries. During their Confinement in the House, they must be often refresh'd with Water, somewhat warm'd by the Heat of *Horse-Dung*, or the *Sun*, and allow'd as much Air as possible.





OF THE
GREEN-HOUSE,
AND
EXOTICK PLANTS.

CHAP. I.

Of the Green-House, or Conservatory; with Directions for sowing Exotick Seeds, and the best Method of gathering them Abroad for Transportation, and the Manner of packing them up.



AS there is nothing more difficult in the Management of *Exotick Plants*, than the right understanding of the *Conservatory*, where they are to stand in the *Winter*, so I think it necessary in this Chapter to prescribe such Rules for the building and ordering of *Green-Houses*, as I have found to forward the Welfare of *Plants*, and as yet have been but little regarded or understood.

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The *Green-Houses*, as they are commonly built, serve more for Ornament than Use; their Situation to receive the *South-Sun*, is the only Thing that seems to be regarded towards the Health of the *Plants* they are to shelter: It is rare to find one among them that will keep a *Plant* well in the *Winter*, either by reason of their Situation in moist Places, their want of *Glasses* enough in the Front; the Disproportion of the Room within them; and sometimes, where it happens that a *Green-House* has been well considered in these Points, all is confounded by the *Flues* under it, which convey the Heat from the *Stoves*.

From the Experience therefore that I have had in the Culture of several Thousands of *Exotick Plants* in different Kinds of Conservatories, I shall venture to give my Sentiments of the Matter.

Besides what is commonly called a *Green-House*, it has been customary to provide *Glass-Cases* of several Kinds, and *Stoves*, for the Preservation of *Plants* brought from different Countries; but I now find they are so many unnecessary Expenses, unless in the Case of some *Plants*, which are brought from the hottest Climates: A good *Green-House*, well contrived, will do all that is required for the Welfare of most *Plants* in the *Winter*: It may be so order'd as to shelter at one time *Orange Trees*, *Plants* from the *Cape of Good Hope*, *Virginia*, *Carolina*, and indeed such as grow within ten Degrees of the *Line*. I must confess, when I was first acquainted with *Aloes*, *Indian Figs*, and such like *Plants*, I thought they could never have Heat enough, and destroyed many by that too common Notion: I could hardly venture them out of *Hot Beds* in the most extreme Heats of the *Summer*; and in the *Winter* they were half roasted with the subterraneous Fires I had made under the *Glass Cases* where they stood.

But

But the great Inconveniencies I found by that Practice, put me upon making other Tryals; I was soon convinced they would live in the open Air in the *Summer*; and I found, that by bringing them acquainted with it in that Season, they became more hardy to resist the Cold of the *Winter*; they were then vigorous and healthful, and I had no more to do in the most rigorous Seasons, but to keep them from the Frosts, and so to dispose the *Conservatory*, that when they came to be shut up in severe Weather, there might be Air enough enclos'd in the House to circulate freely about the *Plants*, and dry up those Damps which are, at such Times, apt to rise from the Moisture of the Pots of Earth; for those Damps I found commonly had the worst Effects upon *Plants*, by bringing Mouldiness upon their Leaves or Stalks, which always rotted them, unless timely prevented. To correct these, as well as prevent the Frosts from getting into the House in very violent Seasons, I made use of a little *Charcoal Fire*, after it burnt clear, and had done smoaking, which I hung up between the Windows and the *Plants*. One of these Fires would keep the Air in the House warm and dry for about Twenty-four Hours, without renewing; and this Method I found had a much better Effect upon the *Plants* than the subterraneous *Fires*, which commonly rais'd Damps, crack'd the Passage of the *Flues* where it run, and often fill'd the House with Smoak, which is a great Enemy to *Plants*, especially the Smoak of the *Sea-Coal*.

Now although I found so much Benefit by *Charcoal Fires*, that in the hardest Winter I did not lose one *Plant*, yet even those Fires are not without their Inconveniencies; where there are many of them, they are so suffocating that several

ral Men have been choaked by them upon going into the Places where they have been burning; and if they be not made to burn clear, before they are put into a House, the Sparks will fly in such great Numbers from the burning Coals, that the House would be in Danger from them of being set on Fire.

These Inconveniencies indeed are enough to lessen our Esteem for *Charcoal Fires*; but it depends upon the Care of the *Gardener* that he avoids those Dangers, by putting into his *Green-House* only a small Fire or two, in Proportion to the Bigness of the House, and by taking Care when he puts them in, that they are rather declining, than increasing in their Heat.

Since I have seen some of the new-invented *Chimneys* so judiciously improved by my learned and ingenious Friend Dr. *Desaguliers*, F. R. S. I am of Opinion, that nothing can be contriv'd more for our Purpose of preserving *Plants* in the *Winter* from Frosts and Damps, than one of them plac'd artificially in some Part of a *Green-House*; they will afford us all that we can desire from an artificial Heat, for the Welfare of *Exotick Plants*, without any Inconvenience attending them; and neither the Trouble nor the Expence of Firing will be near so great as in the preparing of the other Fires I have mentioned; and the Expence perhaps not exceed the Charge some have been at in making and continually repairing *Stoves*, which are frequently out of Order, besides the double Advantage we may have from one of them, by setting it up in some Room joining to the *Green-House*, where although a Fire may be kept constantly, yet the Heat may be let into or kep out of the *Green-House* at pleasure; and that in such Proportions, as to make the Air in the *Conservatory* equal to the

Warmth

Warmth of any Climate we have a mind to imitate, which we may judge of, by placing a *Thermometer* in some Part of the *Green-House*: By Means of this Invention, the Air in the House will be put in Motion, kept dry and warm, and correct the Damps; the House will be replenish'd with fresh Air, as we see Occasion; there will be no Danger of Smoke, or the Charge of frequent Repairs: So that considering all these Excellencies, I cannot conceive that any Invention can exceed this for the Preservation of *Exotick Plants* in the Winter. We may see a farther Account of these *Chimnies* in the Book published by Dr. *Desaguliers*, call'd, *Fires improv'd*.

From hence we may judge that a good *Green-House* ought to be situated upon the dryest Ground, to be as free from Damps as possible; we ought also to provide substantially for the keeping out of Cold, and yet, upon Occasion, to let in Air freely, but chiefly to contrive that the Front of the House be so dispos'd, that nothing may obstruct the Passage of the Sun's Rays in the Winter into the House.

I suppose every one will allow, that the *South Aspect* is the best for a *Green-House*, as it will in that Exposure receive the Sun for the greatest Part of the Day; but in case that cannot be had with Conveniency, the *South-West Aspect* is next to be coveted. I think it would be pleasant, as well as beneficial to *Plants*, if the *Conservatory* was always join'd to the Dwelling-House: Can there be any thing more agreeable in the *Winter*, than to have a View from a *Parlour* or *Study*, through Ranges of *Orange-Trees*, and curious *Plants* of foreign Countries, blossoming, and bearing *Fruit*, when our *Gardens* without Doors are, as it were, in a State of Death, and to walk among those Curiosities of Nature as in the most temperate Climate,

without any Sense of the Frost or pinching Cold that reigns Abroad? And besides, there is this Convenience in the joining the *Conservatory* to the House, that in cold Weather, we may go into it without letting in the cold Air, or blighting Winds from Abroad, which would injure the *Plants*.

The Situation of the *Green-House* being thus fix'd upon, the Proportions of the Building must next be consider'd, and that chiefly in relation to the Height and Breadth of the Room; for the Length of the *Green-House* may be more or less, according to the Fancy of the Owner: But for the better Admission of the Sun's Rays to pass all over the House, the Breadth of it should not be more than the Height from the Floor to the Ceiling, which may be from ten to eighteen Foot.

The Walls toward the *North* and the *East*, must be of a good Thickness, but the Front towards the *South* should be all of *Glass*, excepting a low Wall about a Foot high from the Ground; there ought to be no Peers of Brickwork in the glazed Part, for they cast more Shade into the House, in Proportion to their Bigness, than it can receive Light through the *Glass*; and every one that understands *Exotick Plants*, I am sure will allow, that they should have all the Advantage of the Sun's Rays in the Winter, that they can possibly receive; and for this End, it would be useful in the colder Parts of *England*, to build the Front of the *Green-House* in a Sweep, after the Fashion of a Semicircle, which would then receive the Rays of the Sun from the Time of its rising 'till it sets.

The *Glass* in the Front, whether it be in *Sashes* or *Casements*, must be so contrived, that it may either be made to slide quite below, or above the Frames, or to be taken away as there
is

is Occasion to give Air to the *Plants*, which for about a Fortnight or three Weeks after they are set into the House, and as long before the *Plants* come Abroad, should be quite open, Night and Day, if the Frosts or blighting Winds are not Abroad; but at other Times, while the *Plants* are within Doors, all the *Glass* should be put up, and only opened with Discretion in the Day-time to air the *Plants*: The *Sashes* or *Casements* being open'd more or less, in Proportion as the Weather is cold or warm, and should be always shut close again before the Sun is off the House, that the Air in it may keep warm till the next Day. Some have practis'd with good Success, to lay the Windows of their Conservatories sloping about Ten Inches; but as far as I have experienc'd, they will do as well upright. The Door should be in the Middle of the Front, and at least Four Foot wide, to admit large *Plants*; it should be glazed like the Windows.

To these we must provide strong Shutters, at least an Inch thick, which in the Winter-time should be shut every Night for fear of Frosts, and also in extraordinary cold Weather, when violent Winds blow right against the House.

For the better Security of the *Plants* from Cold, a Place for the laying up the *Gardener's* Tools may be built at the Back of the *Green-House*, and over it a *Fruiter*y, or *Seed-Room*; or in lieu of the latter, fill the Roof full of dry Straw.

The best *Pavement* is that made with Square *Tiles*, which suck up Wet quickly, and never sweat, as *Marble*, or such kind of hard Stone usually does: And for the Lining of the Walls, nothing is preferable to the *Dutch glazed Tiles*, which are soon warmed with the Sun, and reflect a great Heat into the House.

A *Green-House* being built answerable to these Directions, after it is well dried, may receive Plants into it; but nothing injures them more, than to set them in a damp House. In the placing them in the House, we must observe the following Particulars.

It is commonly practised to provide Rows of Shelves placed one higher than the other, from the *East* to the *West* End of the House; these should be made to hold as many Pots with Plants, as will fill up about One fourth of the Space in the House, leaving the rest for Air, to circulate about the *Plants*, when they come to be shut up close in Frosty Weather: For if the House was to be crowded with *Plants* in the *Winter*, their too great Numbers would create Damps, by condensing the Air in the House; but a Quantity of *Plants* proportionable to the Space of the House, as I have already hinted, cannot over-power the Air in it, so far as to produce those Damps. It is observable, That in Countries which abound in Wood, great Rains are very frequent, which seems to inform us, that the cold Nature of the many Trees there growing, and also the Coldness of the Earth under the Trees, condense the Air, and by that means breed Rain more than other Places that are not over-burthen'd with Woods.

In the disposing of the Shelves in the *Green-House*, I allow One third of the Floor for them to stand upon; One third from the first Shelf to the Windows, and as much from the last Shelf to the Back of the House; so that we may walk round the *Plants*, which being placed in the middle Line of the House, are safe from the extreme Cold, which is generally nearer the Walls or Glasses.

Between the Windows and the first Shelf, at one End of the House, should be built the *Chimney*
for

for warming the Air, and the Heat made to come from it into the House, about a Foot above the Floor, which will rise afterwards, and spread itself over the whole. Near the Place where this Heat comes in, place the most tender *Plants*, and, by degrees at greater Distance from it, the most hardy. We may best judge of the Nature and Temper of the *Plants*, by consulting what Climates they were brought from: As for Example; Those which come from Countries near the Line, must have the warmest Place; if they grow on this Side the Line, their Spring begins about the same Time with ours; but if they were brought from the *South-Side* of the Line, then their Spring begins about *August*. All *Plants* of the *Cape of Good-Hope*, and other Parts beyond the Line, such as *Aloes* of those Countries, *Ficoides*, and such like, flourish most with us from *August*, 'till the End of *November*, 'till the Cold of our *Winter* checks their Growth.

All seedling *Plants* from hot Countries, which we raise in the Spring upon *Hot-Beds*, should be used to the Air as much as possible, when they are once come up; for else they will hardly stand the *Winter*, though they are set in the warmest Part of the *Green-House*; but there will be little Danger of losing any of them, after they have been preserved Twelve Months, and have had the Tryal of all our Seasons.

I observe, That the *Plants* which I have raised from *Seeds* brought from *Jamaica*, *Barbadoes*, *St. Christopher's*, and from others of the *Carribbee-Islands*, are the most tender and hard to be kept: But I am persuaded, a House built after the Manner I have directed, with the Addition of one of the *Chimneys* I mention, would keep them, or almost any other, with very little Trouble.

Plants from *Cbina* are indifferently hardy, as well as those from *Persia*; and I find that most of those brought us from the *North* of *Carolina* and *Virginia*, whose Seasons are but a little earlier than ours, and the Difference of Latitude not more than Twenty-five Degrees *South* from *London*, may be naturalized, without Difficulty, to our Climate, after they have been shelter'd for two or three *Winters* with us; witness that Wilderness of *Exotick Plants*, which that wise Encourager of Natural Learning, Dr. *Compton*, late Bishop of *London*, caused to be planted in his Garden at *Fulham*, and have prosper'd so well without Shelter for several Years.

The Time for setting *Exotick Plants*, into the House, is about the second Week in *September*; and the Middle of *May*, if the Frosts are pass'd, they are commonly brought out of the House: But altho' this is become a general Rule (in a manner) among the *Gardeners*, we must yet take this Caution with us, that all Plants are not alike tender; *Orange-Trees*, and most Plants of *Virginia* and *Carolina*, are indeed, rightly set in and out of the *Green-House* at those Times; but *Myrtles* may come abroad sooner by fifteen Days, and remain out of Doors 'till the Middle of *October*. Again, *Aloes* should not be brought out of the House till the first Week in *June*, and set in again about the last Week of *August*; and such *Plants* as live nearest the *Line*, should yet be more confin'd to the House, than any I have yet mentioned: But concerning the housing and bringing abroad of all Sorts of *Exotick Plants*, we must be sure to observe this general Rule, *i. e.* That they must be perfectly free from Wet on their Leaves and Branches, when they are set into the House; and we must always bring them abroad, if possible, with the Advantage of a gentle Shower to wash and refresh their *Leaves*.

It

It next follows, that I describe the Manner of raising *Exotick Plants* from *Seeds*, and that should be done in this Manner : When by Means of Correspondents in foreign Countries, or the Help of curious Persons at Home, who have by their Industry collected the *Seeds* of Foreign Novelties, we are provided with a Collection of *Seeds* from any Hot Country, we must presently prepare a *Hot-Bed* for them ; and while it is settling itself for Use, sow the *Seeds* in *Pots* separately, marking every Sort, that, when they begin to come up, we may the better know what we are to expect. When they have made their first *Leaves*, plant them out in other *Pots*, and give them a fresh *Bed*, when the first is cool, and as soon as the second begins to decay, use them to the Air in the Day-time, to harden them for the *Winter* : If by Chance all the *Seeds* we sow do not come up, keep the *Pots* they were sown in 'till the Spring following in the *Green-House* ; for many *Seeds* will lye in the Ground till the second Year without sprouting, as I have often found, and they always prove to be *Trees*.

And that we may with the more Certainty propagate such *Exotick Plants* from *Seeds*, I think it may not be amiss to consider the most proper Method of gathering them in foreign Countries, and packing them up for Transportation, that what *Seeds* we receive from Abroad, may not lose their *Germinative Faculty* before they come to us, or be destroyed by *Insects*, which often happens.

I would advise then, that all *Seeds* gathered Abroad, which are designed for Transportation, but especially if they are to undergo a long Voyage, should be cut from the *Plant*, with Part of the *Branch* they grow upon, a little before they are going to shed or drop from the *Plants*, and in that Manner laid in the *Sun* to dry thoroughly, before we offer to pack them up, for the least Moisture

will rot the Seeds: All *Beans*, *Pease*, and coddled *Fruits* should remain in their *Seed-Vessels*, which will afford them some Nourishment, and preserve them from the Injury of the Sea-Air, which is pernicious to *Land-Plants*. *Fruits*, such as have a *Pulp* or *Flesh* over their *Seed*, should be dry'd, if possible, with their *Flesh*, and the Stalk or Part of the Branch they grew upon adhering to them; for Nature has provided proper Coverings for every Seed to defend it from Injuries, and for its Nourishment 'till it is fit for the Ground: At the Gathering of every *Seed*, Notice should be taken of the Soil, and the Situation, whether *Sand*, *Loam*, *Clay* or *Rocky*; the Side or Top of a Hill, whether boggy Ground, either expos'd to the Sun, or in shady Places, if under Trees or in Plains; this is so very material, that I know some *Plants* will not grow any where but in Woods, and there only, under particular kinds of Trees; as some of the *Orchis* Kinds for Example, which I have often try'd to propagate in my *Garden* to little Purpose. When a sufficient Collection of *Seeds* is gather'd, and well dry'd, put each Sort by itself into Paper, with its Description, Time of Flowering, the common Names they bear among the Country People, and the Use they make of each Kind; then put the Papers close together into Glafs-Vessels, or Stone or Earthen Pots well glaz'd, and stop'd down close, with Pitch or Rozin melted over the Corks or Stopples: These being so order'd, should be put into a Box, filling up the Spaces between them with dry Sand; and then after the Box is well secured, set it in some dry Place of the Ship.

The smallest kinds of Seeds, and such as are of the least Substance, should be put into dry Sand, in separate Parcels, according to their Kinds; for otherwise they would shrink for want of Air, which they should, as much as possible, be debarr'd

from

from while they are upon the Sea. All bulbous Roots should be taken out of the Ground when their Flower-Stalks begin to decay; and when they are well dried, may be packed up with dry Sand, in Glafs or Stone Veffels.

But if it could be compass'd to fend over *Plants* already growing, plant them four or five Inches afunder in Boxes, having first pruned off their Branches; between them plant the bulbous Roots, and over the whole sprinkle some Seeds of the smallest Kinds, and then make a Cover of Hoops or Lattice-Work, to put over the Box, which will defend the *Plants* while they are at Sea from the *Rats*, and give a free Passage for the Air and Sun to come at the *Plants*. And to be yet more certain of their Welfare, an Outside Case of Boards nail'd close together, may be made to put over the Box in hard Weather, to defend the *Plants* from the Sea-Water: These Boxes should not be very deep, lest they hold the Wet too long about the Roots of the *Plants*: To avoid which, there should be Holes at the Bottom for the free Passage of the Water, which the *Plants* should have in small Quantities when the Earth begins to dry, which, perhaps, may be in Twenty-four Hours in some Climates, and not in Three or Four Days in others. *Plants* pack'd in this Manner, should stand upon Deck if possible.

Thus having laid down the general Rules for the Ordering of a *Green-House*, and the *Plants* to be shelter'd in it, I shall in the next Place proceed to give particular Directions for the Culture of such Kinds of *Exotick Plants*, as merit the most of our Pains and Admiration.



C H A P. II.

Of ORANGE and LEMON-TREES,
and their Culture,

HERE is little Difference in the Manner of ordering the *Orange* and *Lemon-Trees*; and seeing that these Kinds of *Plants* are so beautiful in every Respect, as to merit an universal Esteem, I shall, therefore, be more curious to lay down such Rules for their Management, as may every Way contribute to their Improvement; and first of *Orange-Stocks*, which are brought from *Genoa*, and other Foreign Parts.

The most proper Season for the Importation of *Orange-Stocks* into *England*, is in *February*; so that at least there should be a Fortnight in that Month to prepare them for Growth, that their Shoots may be vigorous and strong the succeeding Summer. When we receive them from Abroad, they have very few Roots and Branches; and as they have commonly been laid up in that Condition, in dry Boxes for some Time before we receive them, they require no small Care to recover them from their Lethargy. I first advise that they be laid upon wet Moss, in some large Room, where they may have the Advantage of as much Air from Abroad as may be (provided it be not too sharp) in the Day-time only for about a Week; this Method, if they are turn'd once in twelve Hours, will recover their shrunk Vessels,
and

and swell their Bark; then their Roots must be examined, and their wounded and dead Parts cut off with a very sharp Knife; and of the Earth about them, if they have any, very little taken away; their small remaining Tops must likewise be prun'd off, leaving only such Shoots as are vigorous about three or four Inches long, and all the Wounds of them closely plaistered over with soft Wax: In this State their Roots must be laid in River or Pond Water for about twelve Hours, and set to drain for about half an Hour after they are taken out, before they are planted.

The Pots for these Stocks, must be just big enough to admit of two Inches thick of the following Earth on every Side their Roots, and no more, lest the Warmth of the *Hot-Bed* they are to be set into, has not Strength enough to reach them, and make them strike, for the *Hot-Bed* must be very moderate and gentle, lest the Roots are scorched, and then it will be to little Purpose ever to attempt the Recovery of the *Plants*.

The Earth which I have made use of with Success, was one third Part of rotted Wood, one third of fresh sandy Loam, and as much *Melon* Earth, well mixed and sifted together; this Soil I always found to make my Trees prosper, and produce excellent Fruit.

The Stocks being in this State, their Pots should be set upon a *Hot-Bed*, prepared as directed in *Chap. I.* of the *Kitchen-Garden*, when the great Heat is past, after the whole Surface of the *Bed* is cover'd with Mold, to prevent the Steam of the Dung rising and annoying the *Plants*.

This *Bed* should be made under a warm Wall, and sheltered from the cold Air with Glass on the Sides, and on the Top: The *Plants* being thus prepared for Growth, must be moderately water'd
5 about

about once a Week till *April*; and then, if the Weather be very warm, every third Day. It is also to be observ'd, That at all such Times as the Sun shines warm upon them, their Tops must be shaded with *Mats*, lest the tender Shoots, which begin to put forth, be scorch'd, and by that Means perish.

In *May*, when their Shoots begin to shoot their Vigour, it will be necessary to give them Air by Degrees, by opening the Glasses towards Sun-set, if the Evenings are not too cold; this, if it be done judiciously, will contribute to strengthen them, and make them shoot green and healthy. During the Course of their first Shoot, they must be shifted every six Weeks at least, into fresh *Hot-Beds*; but as soon as *June* is past, I would not then advise any more forcing, but rather endeavour to prevent them from setting out a second Shoot, by exposing them at large to the open Air, in some Place shaded from the Sun, where they should remain till the first Week in *September*, and then carried into the *Green-House*; at which Time three or four Inches of the Earth on the Top of their Pots should be carefully taken away, without injuring the Roots, and as much fresh Mold put in its Place.

The *Orange-Trees* being thus seated in their *Winter* Habitation, should have as much Air as possible, allowed them Night and Day, till the latter End of *October*; the Windows of the *Green-House* should never be shut during that Time, unless the Winds or Frosts happen to be very severe; and in the following *Winter* Months, when the Weather is moderate, no Opportunity should be let pass of opening the House.

These *Trees*, altho' they love the Shade, yet quickly perish if they have much Water; let them be frequently refreshed with it a little at a Time, left

lest too much Wet about their Roots chill or rot them, and destroy the *Plants*. I find that *Sheep* or *Deer's* Dung, steep'd in the Water for *Orange-Trees*, contributes to make them healthy. The Effect which violent and hasty Waterings will have upon these *Trees*, will be, that the Leaves turn Yellow, and often drop off; and above all, will remain for a Year or two languishing, without putting forth any Shoots, and at Length entirely go off. Now if by these, or some better Directions, a *Gardener* maintains his new *Orange-Trees* in good Health, till the latter End of *February*, let him then renew the Earth as he did in the foregoing *Autumn*, and trim the Heads of his Plants, leaving six Inches, or thereabouts, of the preceding *Summer* Shoots, if they be strong, or less in Proportion, as they are otherwise, plaistering the Wounds with soft Wax, as I have before directed; they will, after this Operation, soon begin to sprout, and make good Shoots the *Summer* following, if they are discreetly made acquainted with the external Air, before they are set out of the House.

It is commonly practised to bring them Abroad about *Mid-May*, especially if moderate Rains fall at the Time: And I have known it laid down as a Rule, to set them out of the House, when the Leaf of the *Mulberry-Tree* is as large as a *Crow's* Foot, which, perhaps, may be a certain Sign of the settled Temperature of the Air. I have indeed myself, had little Regard to either of these Rules, but have chiefly trusted to the Time of the *New Moon* in *May*, which I observe commonly brings gentle Showers, and warm Weather.

For the *Summer* Station of these *Trees*, it is advisable to provide some shady Place in the *Garden*, either by Fencing it in with Hedges of *Dutch Elm*,
Hornbeam,

Hornbeam, Holly, or Evergreen Oaks, about twelve or fifteen Foot high, or else to clear some Place in a *Wilderness* or *Wood* to set them in, such as may be seen at the Right Honourable the Earl of *Essex's* at *Cashibury*, and some other Places; for in such Shelter this *Plant* delights exceedingly. With this Way of Management we may expect handsome Trees in three Years from their first Planting, minding to change their Pots, as the Roots increase in Bigness; which Work is best done in *February*: And let the *Gardener* take this Advice along with it, That he always plants these *Trees* so shallow in their *Pots* or *Cases*, that none of the *Stem* be set below the Earth, but rather let some of the large Roots joining to the *Stem* be seen above it; and also that the Pots be not too large, for then the Roots would chill, by having too much Moisture about them.

The third *Summer* after planting, the *Trees* will begin to blossom, and if they are in Health will bear Fruit, which will be as big as a Musquet-Bullet, when they are put into the House, and ripen the *Summer* following. No skilful *Gardener* will ever covet great Quantities of Blossoms, as they are certain Signs of Weakness, and a Fore-runner of Decay, unless timely prevented by pruning many of them off, as soon as they begin to appear.

That great Encourager of Ingenuity, the late King of *France*, was so much an Admirer of this *Tree*, that he continually had Rows of them flowering in a Gallery of the *Louvre*; they were placed upon *Pedestals*, with Cases of embossed *Silver* over their Pots. I leave my Reader to imagine the Pleasure of such Furniture, which was never wanting, as well in *Winter*, as in the *Summer*. The Manner of bringing the Trees to blossom at every Season was thus; after the

Gardeners

Gardeners had chose a Number of Trees sufficient for their Use, they let them remain without Water till the Leaves dropp'd off; and then giving them fresh Earth on the Tops of their Pots, and frequent Waterings in a Glafs Case, they came out, full of Flowers and fresh Leaves, fit for the Place they were to stand in; these they renewed every Month throughout the Year: And the like Curiosity was also in the Palace of the Prince de Borghese in Rome.

The Situation and Climate natural to this beautiful Tree, may be consider'd in the next Place; and may somewhat help us to judge of the Temper and Nature of the Air it requires: The first Groves of them that we meet with growing wild in Europe, are at Eres near Thoulon in France, which is between forty-two and forty-three Degrees Latitude; and about St. Remo, and the Riviera of Genoa, in the same Latitude near the Sea, at the Foot of very high Mountains to the North of them; and the first Woods of them growing in Italy, are as far South as Gaietta; and so agreeable is the Air of the Sea to them, that in many Places more remote from the Sea than Thoulon and Gaietta, altho' farther South, they cannot be made to thrive, without Shelter, in the Winter.

The various Kinds of Oranges and Lemons, would make a very considerable Article, if I was to mention each Sort in particular, and, indeed, would be of little Use; I shall, therefore, only mention some few which are the most common in our English Gardens. The Seville-Orange is, in my Opinion, the best, as well for the Beauty of its Leaves, as for the Goodness of its Fruit, which will come to Maturity with us. The China-Orange never makes a handsome Tree, but is always inclining to look sickly, and seldom bears Fruit in Perfection. The Curl'd Genoa Orange is somewhat

what more pleasant to the Sight, but is a very slow Grower : And the *Strip'd Genoa*, for the beautiful Variegations of its Leaves may well enough be introduced as a Rarity ; but for its Fruit I have never yet seen it fit for any Use.

The *Portugal Lemon*, and the *Lime*, bear good Fruit, which will ripen so well with us, that I have gathered as good from my own Trees, as any that have been brought from Abroad : *Citrons* and *Shadocks* ripen well in *England*, and if in any Collection they happen to be found, the *Gardener* ought only to observe, that as they will grow much quicker than *Oranges*, so their Pots or Cases ought to be larger, and their Waterings more frequent ; to which I shall add, as a certain Rule, that pruning their Branches must be avoided, as much as possible ; for I have known several Trees spoil by it.

Now although I have given Directions for the Management of large *Orange-Trees*, which are brought us from foreign Parts, and have, by means of the Method I have laid down, eat very good Fruit, which they have produced, yet I find by Experience, that the *Orange Trees* raised in *England* from *Kernels*, are more hardy, and will bear Fruit with more Certainty, and in much greater Quantities, with less Trouble ; and therefore, I shall inform my Reader of the Method which I practise to raise them from Seeds.

In *February* I prepare a *Hot-Bed*, in which (as soon as the burning Heat is past) I place several Pots filled with light dry Earth, and sow the Seeds of *Oranges* and *Lemons* in them, about an Inch deep, where they will remain about ten Days before they appear above the Earth ; give them little Water till they come up, lest you rot the Seeds ; for when they are taken fresh from the Fruit, the outward Membranes which enclose the Seeds, are always
cover'd

cover'd with a kind of *Mucilage*, which will remain moist for several Days, and is sufficient, with the Addition of a small Heat, to make the Seeds sprout, as an Observation of the curious Mr. *Anthony van Leuwenhoek* sufficiently proves. He says, that he took a little *Copper Box*, and put some Sand in it, which, for its Whiteness, and because it is used to scour *Tin*, is called *Scouring Sand*. He adds, This *Sand* was very dry of itself, but was somewhat moistened by the Seeds he put into it, having newly taken them out of an *Orange*; this he did in *November*, and carried the *Box* shut close in the Day-time in his Watch-Pocket, and at Night had it put in a Vessel of hot Water, by which Means the *Box* was constantly kept warm: The sixth Day he opened it, and found that the Seeds had already put forth Roots, near half an Inch in Length; and from Time to Time, as he reviewed them, found them increase and put out Branches. This Experiment of Mr. *Leuwenhoek*, indeed, was made by him for a much greater End than what I now use it for: He endeavours to prove by it, that every Part of a *Plant*, as well their *Leaves*, *Flower*, and *Fruit*, as their *Roots* and *Branches*, are all contained in the *Seeds*; and that their Germination is only the filling and explaining the minute Parts wrapped up in their *Seeds*, and not from any additional Parts they receive from the Earth they are planted in. But see this curious Gentleman's farther Remarks on this Head, in *Philosophical Transactions*, Number 287.

But, to return to my Design, I would rather advise the sowing of *Lemon* or *Citron Seeds*, than those of *Oranges*: for since neither of them will bear Fruit 'till they are either grafted or inoculated, and the *Lemon Stocks* will as well receive the Buds of *Oranges*, as those of its own Kind,

they should be preferred for the sake of their quick Growth, and hardy Constitution. Now, as these *Seeds* will rise at least Four Inches high during the Warmth of their first *Hot Bed*, let their Pots be shifted every five or six Weeks into fresh *Beds*, 'till about *August*, and then begin to harden them for the *Winter*. I have seen *Lemon Plants* raised after this Manner, that have been near Three Foot high the first Year; for growing together in little Groves, each *Plant* has a kind of Emulation to overtop the rest, as if they knew the ill Consequence of superior *Plants* dripping upon them. I have already hinted how much Shade contributes to the Growth of *Plants*, but shall once more remind the *Gardener* to defend these young *Plants* from the hot Summer's Sun, and give them Air only Mornings and Evenings.

The *February* after they are raised, they should be transplanted into small *Pots*, and be put again into a *Hot-Bed*, 'till the Season is sufficiently warm to set them Abroad; and in *July* some of them will be fit to *inoculate*, and the rest to *in-arch* the *May* afterward.

The most proper Season for *budding* these *Trees*, is about the Tenth of *July*, at what Time the *Buds* will readily grow; and the following Spring all the wild Part of the *Plants* above the *Buds* being cut off, and the Wounds covered with soft Wax, we may expect a good bearing Shoot of a Foot long at least, before *Winter*, if they have the Help of a *Hot-Bed*; and in two Years afterward, they will begin to bear Fruit if they are well looked after, and are not over-potted.

But *In-arching* them is yet a much quicker Way to make them bear both *Flowers* and *Fruit*; this Work is done in *May*, and by the latter End of *August* following, they may be cut off; they will then

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then have Fruit upon them, either green or ripe, as you made choice of bearing Boughs to inlay into the wild Stocks. I have heard of Trees, that in less than two Years, from the sowing of the Seeds, have had *Fruit* upon them by this means; and I have myself raised an *Orange-Tree* after this manner, that had *Fruit* and *Flowers* upon it when it was not six Inches high. The ingenious Mr. *Whitmill* at *Hoxton*, by a peculiar Method he has in performing this Work, has now some hundreds of little *Orange* and *Lemon Trees*, with Fruit upon them as large as any that are brought from Abroad.

As I have now given such Directions for the Management and Improvement of *Orange* and *Lemon Trees*, as I have myself practised with good Success, I doubt not, but such as are cultivated by these Rules, will not be less vigorous and healthful. And for some Particulars relating to the preserving them from Frosts and Damps in the *Winter*; see the foregoing Chapter of *Green-Houses*.



CHAP. III.

Of Myrtles, Jasmins, and Geraniums, *their Culture, &c.*

E have many Sorts of *Myrtles* in our *English Gardens* distinguished by the following Names: Those with the largest Leaves, are the *Orange-leav'd Myrtles*, the *Spanish Broad-leaf*, the *Portugal Myrtle*, the *Nutmeg Myrtle*, and that
A a 2 with

with the Double Blossom : Beside which, we have the *Nutmeg Myrtle*, with variegated Leaves, which is accounted a Rarity.

Those with smaller Leaves, are the *Upright Myrtle*, the *Silver-leav'd Myrtle*, the *Box-leav'd* and *Birds-nest Myrtles*, and the *Rosemary* and *Thyme-leav'd* Kinds. All these, except the *Orange-leav'd Myrtle*, and that with the double Blossom, are very easily propagated by Cuttings ; but those two Kinds are much better increased from *Layers*.

The most proper Season of laying *Myrtles* for Increase is in *May*, when the youngest Shoots only, such as are tender, should be bent into the Earth after it is well stirred ; and those, if they are often refreshed with Water, will strike Root, and be fit to take off from the Mother Plants the Spring following ; but, if we lay down Shoots of a Year old, they will never strike Root with all the Art you can use : So we must likewise observe, That the Cuttings we design to plant, should always be young and tender, such as we find upon the *Myrtles* in *July* ; 'tis then the most proper Season for planting them, stripping off the Leaves two Inches from each Cutting, and setting them that Depth, about an Inch a-part, in Pots of fine light Earth, watering them frequently 'till they have taken Root, which will be about the latter End of *August*. This young Plantation should remain 'till the second *March* before they are transplanted into single Pots ; for to remove them sooner, would endanger them, because then their small tender Roots would not be sufficient to draw away the Moisture of the Earth about them so quickly as one could wish, and then it would chill the Roots. However, when they have once got large Roots, they delight in Water, and should be frequently refreshed with it : They covet the Shade in the *Summer*, and will, by means of

of that Help, make much stronger Shoots, than those that are exposed to the Sun.

About *Mid-April* such old Trees as have been neglected, and have thin Heads, may be pruned about the Roots, and fresh Earth put to them, and have the Branches of their Heads cut within three or four Inches of the *Stem*: Being thus ordered, they will prepare for shooting by that Time they come Abroad, and make handsome Plants that Summer, if they have Water and Shade enough.

The *Myrtle* delights so much in Moisture, that I have known a Pot of it set in a shallow Bason of Water, within-side of a Window exposed to the *South*, that has shot above four Times as much in one Summer, as any that have stood Abroad, and has continued growing at that extravagant Rate for some Years, without renewing the Earth in the Pot, by only taking care to supply the Bason with fresh Water as it wanted; but the Shoots of this *Plant* were very slender.

In disposing of these, and other *Plants*, in the Shade, we must not suffer any Trees to drip upon them, or confine them in too close a Place; they must have the free Air round about them, and above them, or else the Shoots they make, will be slender and weak.

The next *Plant* I shall take Notice of is the *Jasmin*, of which we have many Sorts which will not bear the Cold of our Climate, and are therefore sheltered in the *Conservatory* during the *Winter*: They are the *Spanish Jasmin*, the *Portugal Jasmin*, the *Indian Jasmin*, the *Arabian Jasmin*, one Sort with single White Flowers, the other with double Blossoms; and the *Coffee-Tree*, which is another Kind of *Jasmin*, blossoming at *Autumn*: Besides these, there are many other Kinds in the

Amsterdam Gardens, which would be too tedious to mention.

The *Spanish Jasmin* is the most common of these; it bears White Flowers tinged with Purple on the Back of the *Petals*, or *Flower Leaves*, and is very well scented: The Time of its Blossom, is from *August* to *November*, and sometimes all the *Winter*, if it be kept warm, and have Sun enough; this is propagated by grafting it on the *Common White Jasmin* in *March*, as also by in-arching it in *May* upon the same common Sort, and the in-arched *Plants* may be cut off the Middle of *August* following. In *February* we should always cut off the Branches within four or five Inches of the *Stem*; and, after they have fresh Earth put to their Roots, they may be set near the Glasses or Windows of the House; these love not too much Water, and a medium Soil, between Sand and Clay, without Dung; they are to be housed with the *Orange-Tree*.

The *Portugal Jasmin* likewise bears a White Flower tinged with Purple, but the Blossoms are not so large as those of the former, though in much greater Number. Sometimes I have seen near one hundred in a Cluster; they smell like *Orange Flowers*, and last a long Time; the Leaves of the *Plant* are ever Green (as are those of the former) somewhat resembling those of the *Foy*; it is propagated like the foregoing *Jasmin*, and likewise by Cuttings planted in *May*, taking Notice that they be of young Wood, and that at least one Joint be set in the Earth; for at that Part they take Root, though not 'till the second Spring after planting. I find that the *Plants* raised from Cuttings, are apt to shoot very vigorously, and are therefore barren; but those which are grafted or in-arched upon common Stocks, blossom every Year very strong, which may proceed

ceed from the Difference of Vessels in the Stocks and the Graft, which checks its over Vigour.

This *Plant* begins its Blossom in *August*, and continues flowering 'till *October*: We may cut off the in-arched *Plants* in the Middle of *August*, which is the Time of releasing all other *Plants* grafted in the same Manner, setting them immediately under some Shelter, lest they be damaged by the Winds, which often break the *Cion* from the Stock. For this End of *In-arching*, we should be careful to make Provision of some *Plants* of the *Common Jasmin* in Pots the Year before we design to graft, otherwise they will not be vigorous enough to incorporate with the *Cions*.

This *Jasmin* should be set in and out of the House with the *Orange-Tree*, putting fresh Earth to the Roots in the *Spring* and *Autumn*, as we must do to every other *Exotick Plant*: But as *Orange-Trees* love Shade in the *Summer*, this cannot have too much *Sun*.

The *Indian Jasmin* has Leaves somewhat like the former; it bears Bunches of Yellow Flowers of a very agreeable Scent; it begins to flower about *August*, and continues its Blossom 'till the *Spring* following. I have frequently gathered ripe *Seeds* of it, and have raised *Plants* from them, sowing them as soon as they were ripe, and giving them the Assistance of a *Hot-Bed*: But the most common Way of raising this *Plant* is from *Layers* in *Autumn*, or in the *Spring*, when we can get young Shoots to lay down, which should always be as tender as possible for this Work, or they will not strike Root, which must be observed as a Rule in the laying of every Kind of *Plant*. The *Layers* of this *Jasmin* will not be sufficiently rooted, 'till they have been a full Year in the Ground, and then may be taken off and planted in single Pots.

The best Seasons of transplanting this Kind, is either in *April* or Middle of *August*; the Earth for *Orange-Trees* does very well for this *Plant*, and it must be housed as the other Kinds of *Jasmin*.

It would be well to try whether this Sort would not increase by in-arching it upon the *Common Jasmin*; I see no Reason why it should not, as well as the *Portugal* Kind; but if that will not do, the *Common Yellow Jasmin*, I think, can hardly fail.

We have two Kinds of the *Arabian Jasmin*; one with single Flowers, and the other with double Blossoms; in other Respects they are alike, and require the same Kind of *Culture*; the Flowers of both are White, and extremely sweet-scented, but are somewhat differing from the other Kinds of *Jasmin* in their Figure: Both these Sorts blossom about *August*, and with good Management bring a great many Flowers; the Leaves are round, somewhat curl'd, and set on in Pairs at the Joints: I have raised them from Cuttings taken off in *April*, when these *Plants* should be always pruned within two or three Joints of the Stem, and then have fresh Earth put to their Roots, by means of this pruning they will shoot near a Foot in a Summer, as I have seen at the *Leyden Gardens*, where they have near one hundred of them in good Health.

This has been esteemed a very tender *Plant*; but I find it is more injured by Wet than Cold; it will stand the *Winter* very well in such a *Green-House* as I have described, if it has not too much Water, and may be set abroad the latter End of *May*, or Beginning of *June*, and remain out of Doors 'till about the 20th of *August*: The Earth it chiefly delights in is at least two Parts in three
of

of Sand, and the rest fresh Mould from under a Turf: We may try to in-arch it upon the *Spanish Jasmin*, or increase it by *Layers* at the pruning Season.

The *Coffee-Tree* is another kind of *Jasmin* brought from *Arabia Felix*, about the Latitude of 20, or 21; the Leaves are like those of our *Chestnut-Tree*, but are ever green, and the Flowers like those of our *Common Jasmin* in Figure and Colour, but are not so sweet-scented; they grow in Clusters at the Joints, near the Extremities of the young Branches. About *July* this Plant begins to blossom, and continues flowering till *October*, setting plentifully with Fruit, which remains upon the Tree till the *July* following before they ripen, and are then of a dark red Colour; and in their Shape and Size somewhat resembling the Berries of the *Lauro Cerasus*, but have two Kernels in each of them, which split in the Middle like the *Bay-Berries* of the Shops.

In the *Amsterdam Garden*, which is so famous for curious Plants, I have seen some of these Trees near eighteen Foot high, so full of Berries, that several Pound Weight of Fruit was gathered off of two Trees only. The *Hollanders* first got Plants from *Arabia*, which they afterwards planted about *Batavia*, and having increased them there, they supplied the Garden at *Amsterdam* with them, and have now raised so many from Seeds that ripened in *Holland*, that they have sent over several Trees to their Settlement at *Surinam* in the *West-Indies*, in order to cultivate them in that Country, where they will undoubtedly turn to good Account; as I am persuaded they would do if they were propagated in the *South Parts* of *Carolina*; which I think would be well worth our Tryal, if that Country remains in our Hands,

In

In the *Culture* of this *Plant* the *Dutch Gardeners* prepare a *Soil* for it compos'd chiefly of *Sand*, and the *Refreshings* they give it with *Water* are seldom and sparing in the *Winter*; but in the *Summer* it has a more plentiful Allowance, especially during the *Time* of its *Blossom*. About *June* they take it out of the *House*, and wash and clean the *Leaves* and *Branches*, and letting it remain in the *Air* 'till the *Beginning* of *July*, they then set it in again to the *Conservatory* for flowering. In *April* and *August* they give fresh *Earth* to the *Plants*, and they thrive extremely.

In the raising of these *Plants* from *Seeds*, they first separate the *Kernels* in each *Seed*; and after they are cleansed from the *Mucilage* about them, they are immediately set two *Inches* deep in *Pots* fill'd with sandy *Soil*, and plunged into *Hot Beds*: The *Seeds* being thus order'd, must be kept moist by frequent *Sprinklings* of *Water*, till they come up, and the *Glasses* over them always kept close: About six *Weeks* after sowing they will begin to appear, and have two or three *Leaves* apiece before *Winter*. I have heard, that unless the *Seeds* are sown as soon as they are gathered, they will not come up; and hitherto there is no other *Way* known of propagating this *Plant*, but from *Seeds*, though I think it would not be against *Reason*, to try to in-arch it upon some other Kind of *Jasmin*.

The *Geranium* is a *Plant* whose *Varieties* are very considerable, if we were to join those of our own *Country* with the *Kinds* we receive from *Africa*; it takes its Name of *Cranes-Bill* from its *Seeds*, which somewhat resemble the *Beak* of a *Crane* or *Stork*: Hitherto the *Exotick Kinds* have carried *Latin Names* only, which I think help to confound some *Gardeners*, and indeed are too long to recite; I shall therefore, since I have this Opportunity,

tunity, give each Sort, which we cultivate at present in our *Green-Houses*, a short *English* Name for the greater Ease of the Memory.

Many of the Sorts I design to treat of, have been figured by the learned and accurate Dr. *Commelin*, *Botanick* Professor at *Amsterdam*, and that late admirable *Botanist* Dr. *Herman* of *Leyden*, to whose Works I refer for the Cuts of those I am about to mention.

In the *Hortus Lugduno Batavus*, Page 275, we find the *Geranium Africanum Arborescens*, *Ibisci folio rotundo, carlinæ odore*; which we may *English*, The round Mallow-leav'd Cranes-Bill.

Page 278, of the same, *Geranium Africanum Frutescens, malvæ folio Laciniato odorato*: or, Notch'd Mallow-leav'd Cranes-Bill.

Page 283, *Geranium Africanum, Alchimillæ Hirsuto Folio, Floribus Albidis*, or, *Alchimilla*-leav'd Cranes-Bill.

Page 285, *Geranium Africanum, Noctu Olens, Tuberosum & Nodosum, Aquilegiæ foliis*; or, Columbine-leav'd Cranes-Bill.

In Dr. *Commelin's Prælod. Botanic.* Page 51. *Geranium Africanum Arborescens, Archimillæ hirsuto folio, floribus rubicundis*; which we may call, The painted-leav'd Cranes-Bill; as I shall farther explain.

Page 52, *Geranium Africanum, foliis inferioribus Asari, superioribus Staphydis Agriæ, Maculatis, Splendentibus, & acetosæ Sapore*; which we may name, Spotted Ivy-leav'd Cranes-Bill.

Page 54, *Geranium Africanum, frutescens folio Crasso, & Glauco, acetosæ Sapore.*

Beside these, we have in our Gardens, two dwarf Kinds of *Cranes-Bill*, with tuberous Roots, whose Flowers smell sweetly in the Night: I have not seen any Cuts of them, and therefore shall not give the Authors Names; the one I shall call, *The Anemone-leav'd Night-scented Cranest-Bill*, and the other, *The Fennel-leav'd Night-scented Cranest-Bill*.

The first of this List makes a Shrub of three Foot high; the Leaves smell something like *Rhubarb*, and it bears large Bunches of purple Flowers variegated with a darker Colour; this blossoms from *July* to *September*.

The second, with the notch'd Leaves, is a Shrub about the Height of the former, with sweet-scented Leaves; the Flowers are small, and of a very pale purple Colour, and appear about *May* and *June*.

The third has Leaves like the Plant called *Ladies Mantle*, is a low Plant, in comparison with the others, and bears white Flowers about *June*.

The fourth hath large Knots at the Joints, and Leaves like the *Columbine*; the Flowers which commonly appear in the *Summer*, are extremely sweet in the Evenings, but have no Scent in the Day-time.

The fifth, which I call, *The Painted-leav'd Cranest-Bill*, makes a Shrub sometimes four Foot high, and blossoms very plentifully all the *Summer*, bearing large Clusters of Pink-colour'd Flowers; each of its Leaves are curiously marked with a dark-colour'd Streak in the Shape of a Horse-shoe, which, together with the pleasant Green of the Leaf, is very beautiful; and, what is likewise worthy our Notice, when these Leaves decay, the green Parts change into a fair Yellow; and the dark Streaks, which are naturally almost black, alter into a bright *Vermillion*; so that I cannot

cannot help sometimes, for the Sake of so agreeable a Variety, bruising some of them to forward their Decay. The Alteration of Colours in the Leaves of this Plant gave Occasion to a learned Member of the *Royal Society*, Dr. *Stuart*, to consider the Cause of different Colours in the Leaves and Flowers of Plants, which he has so judiciously set forth in a Letter he was pleased to honour me with upon that Subject, that, for the Embellishment of my Work, I shall insert in the Conclusion of this Chapter.

The sixth Kind mentioned in the List has shining Leaves like those of *Ivy*, and pretty Flowers, of a pale purple Colour, variegated with a deep Red: The *Plant* inclines to run upon the Ground, and therefore to give it a better Appearance, we are forced to support it with Stakes; it blossoms in the *Autumn*.

The seventh has thick juicy Leaves of a Sea-green Colour, tasting somewhat like *Sorrel*; the Branches are naturally so weak, that they must be supported with Sticks. About *July* this *Plant* begins to flower, and remains blossoming 'till about *September*; the Flowers of this Kind are of a pale Flesh Colour, and variegated with *Crimson*.

All these Kinds are propagated either by *Seeds* or *Cuttings*; the *Seeds* may be sown in *March* upon a *Hot-Bed*; but the most proper Season of planting the *Cuttings* is about the End of *May*, and then they will easily strike Root in the natural Ground, and become handsome *Plants*, fit to be potted the *August* following; they love a medium Soil without Dung, and delight in Water; they may be housed with the *Orange Trees*, for they are not very tender.

The

The other Kinds of *Geranium*, furnam'd *Night-scented*, blossom at uncertain Times in the *Summer*, and are propagated by parting their Roots in *May*. The Leaves of the *Fennel-leav'd* Kind, have a very grateful Scent; both these are hardy, and may be housed with others; they love a light Soil.

I shall now conclude this Chapter with the ingenious Letter which I promised, relating to the Colours in the Leaves and Flowers of *Plants*.



To Mr. BRADLEY.

LONDON, May 9th, 1717.

S I R,



OUR ingenious Conversation, join'd with the Delights of Mr. *Balle's* curious *Gardens* at *Cambden-House*, made such an Impression t'other Day, as led me into the following Thoughts on the Subject you then started, concerning the Variation of Colours in the *Leaves* and *Flowers* of *Trees* and *Plants*, such as is remarkable in the variegated *Hollies* and *Tulips*; of which Variegation you have certainly assigned the true remote Cause, in the Second Part of your *New Improvements of Planting and Gardening*,

ing, Chap. VII. Sect. I. of the *Tulip*, where you assert, that a Weakness and Defect of Nourishment produce that Variety of Colours, which was not naturally and originally in the *Plant*; which you support by Observations, Experiments and Histories there, and in several other Parts of your Works, so as to put it beyond all Doubt.

On this Occasion you shewed me a bruised and faded Leaf of the *Geranium Africanum Arborescens Alchimilla hirsuto folio, floribus rubicundis, Commel. Præl. Botann.* partly Green, but turn'd of a pretty deep Red in the bruised Parts; this gave Rise to our Discourse concerning the immediate Cause of the natural Colour in Plants, and of this præternatural Colour in the bruised Parts.——I'm perswaded I shall not be able to give one of your Taste any Satisfaction on this Subject: I only venture to send you some loose Thoughts concerning it, being assured that your various Observations and Experience will soon expunge the Errors of one less conversant about these Things.

I imagine then, that the natural as well as præternatural Colours in *Plants* and *Flowers*, are owing immediately to the Juices circulating or contained in their Vessels, and not to the Vessels themselves, which I think appears by the express'd Juice retaining the Colour of the *Leaf* or *Flower* from which it is drawn, while the gross fibrous Part, which is the Vessels retain'd in the Strainer, lose their Colour with their Juice, and being examined by the naked *Eye*, or a *Microscope*, appear colourless or transparent, so far as they are drained of their Contents: These then being transparent, reflect few Rays to our Eyes, but transmit most of them, which the more opake Mass of Fluids reflects, giving us such colour'd Rays of Light, as it cannot absorb or transmit. 'Tis from
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from the Juices then we have the several Colours of *Plants* and their *Flowers*; but what special Texture of the Fluids, and their Surfaces, or of any other Object, may be necessary to reflect this or that kind of colour'd Rays, for ought I know, is not determined with any absolute Certainty.

But as most of our Knowledge of Nature consists in our being able to assign some remoter Causes, and a few Effects of Things, in some gross Manner, rather than in an intimate Acquaintance with their Essences: So after the same Manner we may be able to go some Length in this Disquisition, towards finding out the remoter Cause of Colour in the Juice of *Plants*, though we cannot point out the minute Figures in the Particles of that Fluid, which may immediately produce this Effect.

Thus then the Blossoms and Fruit produced according to the Nature of the ingrafted Branch, and not of the Stock of a different Kind, do shew that the circulating Juice of *Vegetables* is alterable by the Mould of the Vessels through which it passes, so as to be forced by them to put on a different Colour and Taste from what it had before it enter'd them, and we find this equally true in Animals.

There's only some, and those very few, Exceptions of Juices in *Plants*, and common Salt in Animals which seem to be unconquerable by the Power of their Vessels, so as to be able to pass through them, and circulate for some time without any sensible Alteration. The Chymical *Analysis* of the Blood, Urine, &c. of such Animals as use common Salt in their Food, having discovered it unaltered in any of its *Qualities*, after many Circulations in the Animal Body: And by your own Experiments, mentioned Ch. I. Part I.

of

of your *New Improvements of Planting and Gardening*, and *Chap. II. Sect. I.* By these Experiments I say, it appears, that some Juices are so far from being liable to suffer any Alteration by the Vessels of the *Plant* in which they circulate, that they rather seem to have the Power of altering the natural Frame and Texture of the Vessels themselves, and of making a very lasting preternatural Impression upon them, by which they become capable afterwards of moulding and framing their Juice to a different Colour from what it had naturally, and before the Experiment; else it would be very difficult to conceive how such a small Quantity of Juice, communicated from a single Bud of yellow-strip'd *Jasmin*, inoculated upon a Branch of a plain *Jasmin-Tree*, should, in three Months Time, (supposing itself to perish, as the Experiment allows, immediately after that Time) be able to occasion such an Alteration of the natural Juice of the whole Tree, to the Colour of the Bud inoculated, continually through all the succeeding Years of that Tree's Duration; for such a durable Effect must have a permanent Cause, but that cannot be found in the fluctuating Juice, which is daily wasted and renewed, but must be owing to some Alteration in the Figure or Diameters of the Vessels, which may be supposed to continue the same for many Years after, unless some new Alteration be industriously, or by some uncommon Accident, wrought upon them: The Conclusion to be drawn from the Experiment, *Chap. II. Sect. I.* will be much the same.

But Instances of this Kind being very rare, we are only to regard the common Course of Nature, which has made these circulating Juices generally alterable by the Power of the *Solids* or containing *Vessels*, both in *Plants* and *Animals*. Thus

the Juices do seem to get and retain their several natural Colours from the *Solids*, so long as they continue in a due Course of Circulation, through them.—— But when the Circulation, for whatsoever Cause, begins to fail or become languid, there seems to be yet another possible Cause of Colour in *Plants*, to wit, of those preternatural Colours or Variegations, subsequent to a Defect of Nourishment, or a Wound or Bruise in any of their Parts: In all which Cases, the Circulation and concurring Energy of the Vessels are languid; and, therefore, a Degree of Stagnation ensues: And as every Stagnation of a vegetable Juice, is attended with a proportionable Degree of Fermentation, and Fermentation is productive of considerable Alterations, both in the Taste and Colour of the fermenting Juice, it may not be altogether improbable, that in the Cases mentioned, the Variation of Colour may proceed from certain Degrees of Fermentation in the Juice; tho' I only advance this as a probable Conjecture, and not what I can, from any Experiment, demonstrate.

However, to render this Conjecture somewhat probable, we are to consider, that the constant natural Tendency of all recent vegetable Juices is to Fermentation, which commences so soon as they are left to themselves, or delivered from a progressive local Motion of the whole Mass: This appears in the express'd Juice of the *Grape*, and of all *Fruits*, and in *Malt Liquors*, which from the Beginning are in a few Days carried to the Height of Fermentation, in which Time they acquire first a sweetest, and afterwards a vinous Taste; and by a second Fermentation (which in the weakest of them happens very soon after the first) become Vinegar or sowre; their Colour at the same Time becoming less saturated, more transparent,

less

less opaque. But this is yet more remarkable in the Juice of high-colour'd Flowers, as of the *Clove-July-Flowers*, *Corn Poppy*, and *Violet*; all which Juices are apt to ferment in some little Time after Expressing, and in the Fermentation sensibly lose a good deal of their Colour, become paler and more transparent. Indeed, the *Violet* Juice loses almost entirely its Colour in Fermentation. The same Fermentation happens to the Juice of Vegetables yet contained in their Vessels, and enjoying some low Degree of irregular Circulation, as appears by *Herbs*, *Grass*, *Hay*, *Flowers*, *Fruits*, &c. cut down and thrown together in a Heap, where all the Signs of Fermentation do very soon appear; such as *Heat*, *Sweating*, change of *Smell*, *Taste* and *Colour*; so that it seems plain, that Fermentation in all its Effects, takes Place in the Vegetable Juices, so soon, and as far as the Circulation declines: These two different Powers or Operations of Nature, being so contrary to one another, that they cannot subsist together in Perfection, but, like the opposite Weight in the Scales of a Balance, as the one preponderates, the other must give way. And, indeed, the Case in *Animals* is very near parallel to this, if we substitute Putrification in them, to Fermentation in *Vegetables*; for in those we find, that the Blood in a bruised Part degenerates from its natural Colour by Stagnation, into a Livid, Blue, Green and Yellow (all Signs of Putrification) successively, until the Re-absorption be perfected, and the Circulation restored. — This is farther illustrated by the common Practice of ripening green Fruit in Straw, or in a moderate Warmth, where Evaporation of the Juice and Defecation may be avoided; which shews, that the Change of Taste and Colour can be owing to nothing else here, than a certain slow Degree of Fermentation, en-

tertained by that Artifice, in the Juice contained within the Vessel or Vesicles of the Fruit: Was there, indeed, a free and open Communication with the external Air, this Fermentation would go on to produce the same Effects more quicker, as we see in the same Juice expressed: And as all Experiments in Fermentation do shew, that either a total Stagnation, or some Degree of it, and Heat, are necessary to produce Fermentation in vegetable Juices, the Autumn affording us a slow Circulation of the Juices, and an increased Heat; these two concurring, must needs produce that Degree of Fermentation, to which we owe the Ripeness of our growing Fruits, and the Change of their Colours and Taste in that declining Season; as we owe the Ripeness of our Liquors more remarkably to the very same Causes: And was it possible there should be a perpetual Spring, that is, a continued equal brisk Circulation of the Juices, with such a low Degree of Heat as that Season affords, it would be equally impossible to produce ripe Fruit, because the two Pre-requisites of Fermentation would be wanting in Nature, tho' Art might, in some measure, supply that Defect.

The Conclusion then seems to be this; That Circulation and Fermentation are the Two only Powers in Nature, which can produce the Variety of Colours, and the other Changes we observe in Vegetables; as Circulation and Putrifaction are the two Powers that work the various Changes in Animals: And that as the due Degree of Circulation in either, declines, or is impaired, Fermentation or Putrifaction takes place respectively, exhibiting the Signs of Diseases or Decay, of which themselves are the immediate Causes.

If I rightly remember, something was mentioned in our Conversation concerning the different

ferent Strength of the coloured Rays of the *Sun*, and whether the Reflection of these stronger or weaker Rays, might not depend upon a suitable Strength and Weakness in the Texture of the *Plant* or *Flower*; as if the strongest Rays, which are the Red, being reflected by a red *Flower*, might not argue a greater Strength in the Texture of that Flower, or its Juices, than is in the blue *Flowers*, which reflect only the Blue, to wit, the weaker Rays of the *Sun*.

If we may judge of the Strength of the Rays of the *Sun*, by their different Degrees of Refraction in passing through a *Prison*; as the Refraction increaseth, so their Strength decreaseth in this Order; *Red*, *Orange*, *Yellow*, *Green*, *Blue*, *Purple*, and *Violet*; so that the *Red* is the strongest, suffering least Refraction, and *Violet* the weakest, as it suffers the greatest Refraction. But when we consider these Rays, as reflected from opaque Bodies, we find that Objects of the weakest Texture, reflect the same Kind of Rays with those of the strongest make, as *Red* is shewn by the tender *Tulip*, as well as by the more durable *Rose*; and so in a Variety of other Objects, differing yet more in Strength or Weakness: So that the Strength of Bodies reflecting Light, seems not to be so much concerned in the Reflection, as the Frame and Disposition of their Surfaces, which may be the same in the Weakest, as in an Object of the strongest Composition. Besides, the Strength of the Texture of *Plants* and their *Flowers*, seem to depend more upon the Firmness and Disposition of their Vessels, than upon the Consistence of their Juices; but their Vessels, being transparent, are least concerned in the Reflection of Colours; therefore the reflected Colour seems not to depend upon any Proposition of Strength or Weakness in the *Plant* or *Flower*.

Thus, Sir, I have ventured to shew you how superficial and conjectural my Knowledge on this Subject is, in hopes that you'll forgive and correct the Faults, which my Compliance with your Desire has led me to discover; being, with sincere Respect and Esteem,

S I R,

Your most Humble

And Obedient Servant,

ALEX. STUART.



C H A P. IV.

Of the Culture of the Melianthus, Oleander, Malabar-Nut, Leonurus, Amomum Plinii, Caper, Acacia, Apocinum, and other Exotick Shrubs, which are not succulent.



OF the *Melianthus* we have two Kinds, the Greater and the Lesser; they are both *African Plants*, and blossom freely with us, especially if they are not used too tenderly. The large Kind will stand abroad during the Winter, and seldom fails to produce its Spikes of Flowers every Year, which are of a *Coffee Colour*: These Flowers afford each of them a Drop or two of a clammy Juice, tasting as sweet as Honey, from whence I suppose it took its Name of *Melianthus*, or *Honey-Flower*. The smallest Sort is not so common with us as the other, and is therefore kept in the House all *Winter*; tho' I am of Opinion, it would stand abroad

abroad as well as the large Kind, which comes from the same Country. The Flowers of this small sort are very beautiful, having a Mixture of Red, Green and Yellow in them. Both these Plants are propagated with Ease, from Slips taken from about the Roots any time between *May* and *August*; they delight in sandy Soil, and much Water, especially the large Kind. Both these are design'd with great Accuracy; the first in the *Hortus Lugd. Bat.* and the small sort in Dr. *Commelin's Plant. Rarior. Amstelod.*

The *Oleander* or *Nerium*, which some call the *Indian Laurel*, has many Varieties. The most common of them in the *English Gardens*, is, the Sort with the red Flower, which is call'd the *Scarlet Oleander*: It is so hardy, that I have kept it abroad all *Winter*, without any other Shelter than a *South Wall*. It is easily propagated by Layers in *April*, which will strike Root to transplant the *August* following. We have likewise a white flowering Kind, as hardy as the *Scarlet Sort*; but the other Varieties of this Plant, such as the *sweet-scented Oleanders*, with *Single* and *Double Flowers*, are esteem'd more tender, and should be housed with the *Orange-Trees*: All these blossom in *July* and *August*, and are propagated like the first; they love a medium Soil, without Mixture, and moderate Watering. See the Figures of the two last in the *Hortus Lugd. Bat.*

The *Adhatoda Zeylanensium*, call'd by our Gardeners, the *Malabar-Nut*, is very apt to blossom with us, but has not yet, as far as I can learn, produced any ripe Fruit in *England*: It makes a large Plant, and is pretty hardy, and is an extravagant Lover of Water: The Earth should be the same as for the *Oleander*, and the Pots large; for these Trees increase prodigiously in their Roots, which should be prun'd every *August*,

and fresh Earth put to them: This is increased from Cuttings planted in *May*, which strike Root very easily in the natural Ground: It must be housed with the *Orange-Tree*. There is a good Cut of this *Plant* in the *Hortus Lugd. Bat.*

The *Leonurus* is a *Plant* of the *Cape of Good-Hope*, named by *Breimus*; it is of the Species of the *Sideritis* or *Iron-Wort*, in which Tribe Mr. *Ray* has plac'd it: We have two Sorts, one with Leaves like *Hemp*, and the other with round notch'd Leaves, like those of the *Lamium*, or *Dead-Nettle*; the Flowers of both Kinds are alike, of an *Orange-Colour*, and of the same Size and Figure, blossoming in *September* and *October*; they are both easily propagated by Cuttings planted in any of the *Summer* Months upon a common Border, where they soon strike Root, if they have Water enough; the Earth for the foregoing Plants is very fit for this, and in every Respect it should be treated like the *Malabar-Nut*.

The *Amomum Plinii*, or *Tree Night-Shade*, is a pretty Shrub, easily propagated, either from *Seeds* or *Cuttings*, which we may put into the natural Ground in *May*; the *Berries* are somewhat like *Cherries*, and ripen soon after the *Plant* is brought into the House, and remain upon the *Plant* all *Winter*; it is called by some therefore, the *Winter-Cherry*, which is the most common Name: Its Culture is the same with the foregoing *Plant*; only to make it bear Fruit plentifully, it may be brought out of the House with the *Myrtle*; and during the *Summer*, it must stand in some Place defended from the *Sun*, and constantly supply'd with Water; but it will not bear any Fruit if it be set under Trees: It is so hardy, that I believe it would stand Abroad all the Year, but I have not yet try'd it.

In the same Tribe is the *Mala Insana*, or *Mad Apples*, or the *Solanum Pomiferum*, which is extremely well figur'd in the *Hort. Lugd. Bat.* It has Leaves deeply notch'd and arm'd with *Spines*; the Flowers are of a deep Purple, and the Fruit, before they ripen, variegated with White and Green; and being fully mature, are as large as ordinary *Golden-Pippins*, and of a bright yellow Colour; these Fruits ripen in the *Winter*, and contain many small Seeds, like those of the *Capficum Indicum*, or what we call *Guiney-Pepper*; they may be sown in *March* or *April* upon *Hot-Beds*, and will bear Fruit the second Year: Give this *Plant* the same Earth as the *Orange-Tree*, and house it at the same Season: This, like all other potted *Plants*, must have fresh Earth every Spring and Autumn. Besides this, we have another Kind, whose Leaves are shaped like those of the *Oak*, but are so hoary, that they seem to be made of white Woollen-Cloth; this Sort bears smaller Fruit than the other, of a Golden Colour, which also ripen in the *Winter*: It requires the same Management as the former Kinds.

The *Caper* has been propagated with great Care in our *Green-Houses*, to very little Purpose: Where the greatest Industry has been used, it has hardly been brought to flower in *England*; and tho' it has had the Advantage of the best Stoves, it has been subject to die in the *Winter*, which has given Occasion to some *Gardeners*, to believe it was too tender for this Climate; but that Notion is unreasonable, since we know the *Caper* is an *European Plant*, growing familiarly about *Genoa*, and the *South Parts* of *France*; the Soil and Situation is only to be consulted to make it thrive very well in *England*, even in the open Air. It will resist the Severities of our *Winters*, as I have experienc'd, being sown in the Cracks of old Walls,

Walls, where it strikes Roots in the Mortar: Where it grows wild, it grows in like manner, on the sides of Rocky Places among Rubbish, and in Holes of old Stone Walls or Ruins; if even it is planted in a Pot of Rubbish, it will not thrive, if it is directed to go upright, but must rather be so disposed, as either its Root may be somewhat above the Branches, or at least it may grow horizontally, such as it will do, if it be set in the Side of a Wall. The Blossoms are very beautiful, of a whitish Colour, crouded with *Tendrils* or *Stamens* of an *Orange* Colour. The Buds of these Blossoms are pickled for Eating. It may be as well propagated in *England*, as in any other Part of *Europe*, by observing the Method I describe, and sowing the Seeds in *March*, which readily come up, if we cover them with sifted Rubbish after we have laid them in their proper Places. It has been a great Fault that some have been guilty of, when they have received *Plants* and *Seeds* from foreign Countries, to give them too much Warmth, without considering whether they came from the *North* or the *South*; from *Muscovy*, or *Greenland*, or under the *Line*. I am of Opinion it would be as hard to keep an *Iceland* Plant with us, as one that grew immediately under the *Line*; for as the one is naturally maintain'd by excessive Cold, so is the other by extreme Heat. I imagine that the greatest Cold of our *Winters*, is near the same with the Temper of Air in the *Summers* of those Countries lying in seventy or seventy-five Degrees Latitude; and if so, then the *Plants* from those frozen Parts of the World, could only be made to grow with us in our colder Seasons, when perhaps they would not be naturally inclin'd to shoot, for then the Sun would be far distant from their native Country, which would be the Time

Time of their *Winter*; and if we could make them shoot at that Time by our natural Temper of Air, the Heat of our *Summers* would afterwards scorch them to Death, or smother them, unless they were to be kept in *Ice-Houses* during the Season of our warm Weather, and not expos'd abroad till our Frosts began: For if we were to follow Nature in the *Culture* of *Plants* from Hot Countries, we must do the same in the Management of those from the frozen *Zone*; we must imitate the Heat of one, and the Cold of the other.

Let us not therefore mistake, in supposing that the same Degree of the Sun's Heat, and the same Temperature of Air, which is natural to any one Part of the World, is necessary for the setting in Motion, the *Sap* of the several *Plants* natural to divers Countries: As every Climate is different from the rest, so are the several *Plants* in those Climates naturally adapted to grow by means of the wonted Temper of Air and Warmth of their native Countries, and will not thrive near so well in Stations only a little differing from the Place of their Birth: And, indeed, it is partly the same in living Creatures, which we find do not all require the same Degrees of Warmth for hatching them for their Eggs: The same Heat which hatches the Egg of a *Pullet*, would destroy the Eggs of *Insects*: And I suppose that the Warmth which hatches a *Pullet*, would not be half enough to hatch the Egg of an *Ostrich*, who is forced to lay her Eggs in the scorching Sands of *Africa*, to bring them to Life.

It is observable, That *Mosses* of several Kinds only grow with us in the *Winter*; and at the least Approach of warm Weather they decay, and are entirely at a Stand, and seemingly dead when our *Summers* begin; which may shew us that there are *Plants* that grow in certain Degrees of Cold
(as

(as we call it) as well as Heat; for *Mosses* are no less perfect *Plants* than *Oaks*, or other the most remarkable *Trees*; they have *Roots*, *Branches*, *Leaves*, *Flowers* and *Fruit*, as well as the most notable *Plant*. I have heard that the colder *Climes* abound with *Mosses*, which are still larger and in greater *Quantities*, as we go more towards the *North*; and that they serve for Food for the *Rane Deer* in the *North Parts* of *Muscovy*. I remember once to have seen a *Plant* brought from about *Norway*, which grew in 65 or 66 Degrees, that budded out in *December*, and continued growing till the following *March*; but after that I am not well assured what became of it. But 'tis Time now that I return to the *Culture* of those *Plants* I undertook to treat of in this *Chapter*. Besides the *Caper* already mentioned, we have two other *Kinds*, That with the small yellow Flower, and the *Bean-Caper*; they are both raised from *Seeds* sown in *March* in sandy Soil; the first requires the *Green-House* in the *Winter*, but the other will thrive very well in an open *Border*, as I have seen done in the *Amsterdam Gardens*, altho' it is commonly housed with great Care in *England*.

I have seen many sorts of *Acacia* cultivated in the *Amsterdam Gardens*; and I remember formerly three or four Sorts of them were growing among the *Rarities* at *Hampton-Court*; but at present we have few of them in *England*, unless it be the *Virginian Kind*, which grows to a large *Tree*, and will stand abroad without Shelter in the *Winter*; as we may see some of them now growing in the Court before *Russel-House*, *Bloomsbury*, and in the *Old Palace Yard*, *Westminster*; a plain Proof we might easily naturalize the *Virginian Plants* to our *Climate*. The *Leaves* of this, and other *Acacias*, are not unlike those of the *Tare* or *Vetch* and differ from one another chiefly by being larger

or smaller, and not in their Shape: Some again are varied from the rest, by having large Spines or Thorns growing upon the Foot Stalks of the Leaves, sometimes as large as Cock-Spurs, and the Flowers of some of them are sweet-scented; these, as they come from several Parts of the World, should be considered in relation to the Heat necessary for them; but they all, so far as I yet have observed, love a dry sandy Soil, and little Water.

The *Apocinum*, or *Dog's Bane*, has many Varieties; some growing upright like little Trees, and others climbing and creeping on the Ground like the *Woodbind*: The Flowers in their Shape, are not much unlike those of the *Amomum Plinii*, but have their Petals turned more back; their Colours are various; these all bear Cods, for the most part shaped like those of the long *Guiney-Pepper*, but their Out-sides commonly covered with long tender Spines of the same Colour with themselves; within them are the Seeds, lying as it were in a Bed of Cotton, some of which adheres to each of them: from the Seeds we may propagate them with ease, by sowing them in *March* on *Hot-Beds*, or else raise every Sort I have yet tried, from Cutting in the same Month, unless they be such as have Tuberous Roots, which must then be parted; and some indeed which die to the Root every *Winter*, will be better increased from *Off-sets* taken from the Roots: I give them commonly a light natural Soil, which I find agrees well with them, and little Water; for they are all very Milky, and apt to rot with much Wet. As to their Shelter in the *Winter*, it may be given them according to the different Climates they come from, and be set into the House sooner or later, as they are more or less tender.

We

We have two Sorts of the *Canna Indica*, or *Indian Cane*; one with plain Green *Leaves*, and the other with variegated *Leaves*: they both flower in the Autumn, producing Spikes of Scarlet Blossoms extremely beautiful: The First is raised from Seeds sown in *March*, upon a *Hot-Bed*, and may be increased by parting the Roots in the same Month, and so the strip'd Sort also is propagated by *Off-sets*; for the *Seeds* of the strip'd Kind, which often ripen in *England*, will produce *Plants* with plain *Leaves*: They delight in a sandy Soil, and little Water, and must be housed with the *Orange-Tree*.

Of the *Genista* we have several Sorts which are cultivated in *Green-Houses*; they all love a sandy dry Soil, and are always propagated from *Seeds*; for *Cuttings* will not take Root: neither do I believe *Layers* will succeed any better. As most of them have few spongy or parenchymous Parts, they require little Water, and should be housed according to their Climates.

The *Palm* or *Date-Trees*, are only propagated by setting the *Date-Stones* in light Earth in *March*, and giving them the Assistance of a *Hot-Bed*; they are indeed slow Growers, but indifferently hardy; they grow in *Italy* without any Shelter, and I believe might be brought to stand abroad in *England*, after giving them Shelter for the Three or Four first Years.

The *Jalop-Tree* of *Carolina*, called in *Virginia* *Poke*, is a *Plant* that dies to the Root every *Winter*, and rises again in the Spring to the Height of Eight or Ten Foot, having many Branches of a Red Colour; the *Leaves* smooth, and of a pleasant Green; the *Berries* are like *Elder-Berries*, but grow in long Bunches somewhat like *Grapes*; these are used for dying Red; the young *Tops* are pleasant and wholesome, when they are well
boiled,

boiled, and are frequently eaten by the People of *Virginia*; but if we gather them too old, they purge and vomit violently: The *Pigeon*, and other Birds, are very greedy of the *Berries* of this *Plant*; a *Dram* of the Root dry'd and powder'd (says my Correspondent) is a very safe and good Purge, very much like *Jalap*, and is frequently used by the *Indians*. This is raised from the *Berries* sown early in the Spring on a *Hot-Bed*, and delights in a rich warm Soil: it should be housed with the *Orange*.

The *Pitchimom* or *Persimom-Plum*, called by the *Indians*, *Putchimon*, is a *Plant* of *Virginia*, where it grows to the Size of a common *Cherry-Tree*, the Wood is white, and the Leaves very green and shining on the upper Side; the Fruit somewhat like a *Medlar*, with several Seeds in it; when it is ripe, it is soft and luscious: This *Plant* may be propagated by sowing the *Seeds* in *March*, like the former. It loves a light Soil, and little Water, and may be housed with the foregoing *Plant*.

The *Side-Saddle Flower*, is a *Plant* growing in *Virginia* and *Carolina*, which, according to the Description I have had of it, with its *Seeds*, which I have received from several Hands this Spring, is one of the most surprising *Plants* of those Countries; it dies every Year to the Root, and rises afresh every Spring, putting forth at that Time a yellow Flower upon a slender Foot-Stalk with six Leaves, shaped somewhat like those of the *Flower-de-luce*; upon the Top of the Stile grows a Sort of Canopy, round on the Top, like the Seat of a Side-Saddle, under which is the Seed-Vessel, divided into six Cells; the Plan follows the Flower, growing about a Foot high, and somewhat shaped like a *Trumpet*; upon the Top of which is a Leaf like the Lid of a *Can*, which is, at the first coming

coming up, very green, but afterwards becomes yellow, full of purple Veins; it grows in spongy Ground in watry Places, so that it must be sown in Pots of Earth, as nearly imitating Bogs as can be, and set upon *Hot-Beds*, minding to refresh the Earth constantly with Water as it begins to dry. House this with the foregoing *Plant*.

Virginian Dog-Wood, makes a Tree about the Size of a common *Cherry-Tree*, blossoming early in the Spring; the Flowers are white, growing in Branches, and are succeeded by red Berries, which hang a long Time upon the Tree: Sow them in Pots of light Earth in Autumn, and let them stand the *Winter* in the *Green-House*, giving them the Assistance of a *Hot-Bed* the following Spring. The *Indians* boil the Roots of this Plant in Water, which they account good to heal Wounds.

The *Sassafras Tree* is also a *Plant* of *Virginia*, whose Figure we may see in *Gerbard's Herbal*, but the Description is imperfect: It loses its Leaves in the Winter, and in the Spring puts forth its Flowers of yellow Colour in Clusters, succeeded by blue Berries, somewhat like those of the *Laurustinus*, upon red Foot-stalks: These Berries should be sown at Autumn like those of the foregoing *Plant*; it loves a light Soil, and I believe it might be made to grow in our Woods, after it is a little hardened and used to our Climate.

The *Virginia Wild Crab-Tree* has Blossoms somewhat like the *Apple*, but very pleasant to the Smell; it bears small Fruit of a yellowish Colour, and well-scented, which the *Indians* preserve in *Sugars*: This is raised from Seeds sown in *March* upon *Hot-Beds*, and loves a light dry Soil; house it with the others of this Country 'till it becomes hardy enough to be planted Abroad.

The

The *Virginia Myrtle*, or *Cancel-Berry Tree*, is Ever-green and Aromatick ; it bears Berries about the Size of a small *Vetch*, from which is drawn the *Green Wax* which *Candles* are made of; this *Wax* partakes so much of the natural Scent of the *Plant*, that the least Bit of it being burnt upon Coals, will perfume a whole Room. The Berries must be sown at *Autumn* in Pots of black sandy Earth, and kept continually moist, as well before they sprout, as after they come up ; let this be housed with the foregoing *Plant*.

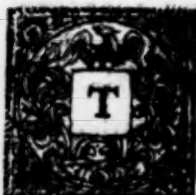
It would be endless to enumerate the several Trees and Shrubs of foreign Countries that are propagated in *Green Houses* ; and I doubt not but such as will mind the foregoing Directions in this Chapter, will easily, from Experience, discover the right *Culture* of whatever *Plants* they get into their Collection. In the mean time, I shall proceed to lay down the best Methods of treating such kinds of Plants as abound in Juice, and are called *Succulent Plants*.





C H A P . V.

Of Aloes, Torch-Thistles, Melon-Thistles, Fig-Marygold, House-Leeks, *the* Euphorbium, and other Succulent Exotick Plants, *their* Culture.



THE *Plants* which I design to treat of in this Chapter are commonly styled *Succulent*, for that they are plump and full of Juice, which they chiefly gather from the Air, as by Experience we find; witness the *Sempervive*, a kind of *Aloe*, which will live some Years without Earth or Water, being hung up in a Room; and the *Sedum Arborescens*, which I have known to be kept after the same Manner for many Years; in which *Plant* it is observable, that against Rain it puts forth Roots or little Fibres striking into the Air, which in damp Seasons is thick enough to afford it that Help, and some Nourishment; but as soon as the Air begins to grow thinner, and is more rarified, those Roots dry up before they can provide themselves with Nourishment sufficient to supply the *Plant* they spring from, which perhaps they would do, if they could enjoy that thicken'd Air three or four Months without Alteration.

The first kind of *Succulent Plant* I shall mention is the *Aloe*, which, in my Opinion, is the most beautiful Tribe of *Plants* belonging to the *Green-House*. The most common Kind in our Gardens, with some few other Sorts, are brought from

from *America*; but the greatest Varieties of them, and I think the best Kinds, come from *Africa*, chiefly from the *Cape of Good Hope*. *Aloes*, for the most Part, are composed of many succulent Leaves, long and sharp at their Points, commonly armed with *Spines*: The Leaves spring immediately from the Root, and are placed in a Round, representing the Rays of the Sun; from their Centre shoots forth the Flower-Stem, which sometimes divides itself into Branches, but not always: Upon these *Stems* appear the Flowers, which are *monopetalous*, but oftentimes are so deeply cut on the Edges, that, without strict Examination, they appear to have six *Petals*. They are most like the Flowers of the *Hyacinth* in their Figure; but are seldom sweet-scented, and each Fruit has little black Seeds in it, lodged in three separate *Cells*.

Some *Aloes* are Arboresecent, inclining to make Trees, breaking forth into Branches; as one Sort which has Leaves somewhat shaped like those of a *Narcissus*, but larger, more succulent, and of a whitish Colour; but this is so rare, that I know not of any *Plant* of it in *England*, but what I brought with me from Abroad, and have now growing: We have other Kinds, which are so small, that a whole *Plant* does not exceed the Bigness of a Crown-piece; some grow close to the Ground, others are more aspiring, and have their Crown of Leaves raised upon a Stem somewhat above the Earth: In short, they are surprisingly different from one another, and deserve our Care and Admiration as much as any *Plant* whatever.

I have seen above sixty different Kinds of *Aloes* in the *Physick-Garden* of *Amsterdam*, chiefly the Product of the *Cape of Good Hope*; some of them have been raised from *Seeds* from that Place, and others from young *Plants* rising from the Roots,

or putting forth from the *Stems*; these are used with great *Tenderness* in *Holland*; but I find they are most of them as hardy as any other *Plant* growing about the *Cape*; for of the forty *Sorts* which I have cultivated for the three last *Years*, I have not lost one by *Cold*; but I find that it is *Wet* chiefly that injures them. In *Africa* they all grow in stony *Places*, and upon rocky *Ground*, therefore the *Earth* I prepare for them is one half sandy *Soil*, and the other *Rubbish* of old *Walls*, well sifted and mixed together, which contributes to keep them from rotting at the *Roots*; and in planting them, I observe always to set them very shallow in the *Pots*, raising the *Earth* in that *Manner*, that the *Plant* stands as it were upon a *Hill*, falling every way to the *Edge* of the *Pot*; so that when they require any *Water*, it may be given them, without touching any *Part* of the *Plant*; which, if it should so happen, unless the *Sun* immediately dries it up, the *Plant* would be in *Danger* of rotting.

In the *Summer* indeed, when they are *Abroad*, a little *Rain* will not hurt them, because they then cannot remain wet very long; otherwise, the *Wet* that will settle in the *Heart* of the *Plants* when the *Rain* falls upon them, would destroy them: I therefore chuse to keep them in the *House* till *June*, and return them thither from *Abroad* in *August*, to avoid the *Danger* of too much *Moisture*, which they can hardly meet with between those *Months*.

While they are *Abroad*, if the *Weather* be fair, they will require moderate *Waterings* once a *Week*, if the *Earth* is very dry: And from the *Time* of their *Housing*, till the *Middle* of *October*, gentle *Refreshments* may be given them in the *Mornings*, while the *Sun* is upon them, for then is the *Time* of their *Growth*: But from
October

October to the middle of *March*, or thereabouts, they must be kept very dry, and not have the least Moisture, though the Earth be like Powder; for they cannot dispense with any Wet, till the Sun begins to grow powerful with us, and can dry it immediately. In *May* give them fresh Earth, and they may be transplanted at that Season, but without disturbing the Roots; but the best Time of the Year for that Work is the Beginning of *August*, when they will best be disposed to make fresh Roots; and this must be done about ten Days before they are sent into the House, for the open Air helps them to strike the Roots, as I shall endeavour to prove.

I once had some Off-sets and Branches of *Aloes* sent me in *May*, without any Roots; and after having let them lye in the Sun for three or four Days to dry, and heal the wounded Parts, I put them into *Hot-Beds*, according to the usual Method; but with all the Art I could use to them, I found them sensibly declined, till at last they were reduced almost to nothing; I then so far despair'd of saving them, finding the *Summer* almost past, that, in the Beginning of *August*, I flung them out of my Garden carelessly, with some other Things that had suffered in the same Manner; but to my great Surprise, after they had lain Abroad about three Weeks, they struck Roots into the Ground they lay upon, and began to shoot out fresh Leaves: By this Accident, I not only saved the *Plants*, but took such Methods for the Management of others of the like Kind, that now I do not know any *Plants* in better Health than my own; and I find the best Season for planting the Off-sets of *Aloes*, is about the Middle of *July*, letting them stand abroad about ten Days, and take the Rain if possible; when they begin to strike Root, then they may

be help'd with a *Hot-Bed*, but not before. The Seeds of many Sorts ripen in *England*, and may be sown upon *Hot-Beds* in *April*.

I observe that such *Aloes* as put out their Offsets above Ground, *i. e.* from the Side of their Stems, may be made to set out those young Shoots for Increase, by taking away some of the under Leaves which grown next the Earth; for from those Places where the Leaves have grown, will always shoot forth young *Aloes*; but this Work should be carefully done without bruising the Stem or other Leaves, and at such a Time in the *Summer*, when the *Sun* is in its greatest Force; for although the Leaves will easily peel from the Body of the *Plant* without breaking, yet there will be a Moisture remaining about the Part they were join'd to, which would breed Mouldiness, and be apt to rot, if it was not quickly dry'd up.

This, and all other *Succulent Plants*, are so sensible of the least Bruise, that I have known many dye by that Accident; to pinch one single Leaf will mortify a whole *Plant*, unless the bruised Part be presently cut off.

We may see the Figures of many Kinds of *Aloes* in Dr. *Commelin's* curious Books of *Plants*; many of which has been given us, with their *Flowers*, and are extremely well designed. The more hardy this Kind of *Plant* is kept, the more apt it is to flower, which I know from Experience, having not less than twelve Sorts, which blossom with me every Year.

The *Torch-Tbistle* or *Cereus* is a *Plant* very different from any other *Tribe of Plants*, in that it never bears any Leaves. I have cultivated about seven Sorts of it, without reckoning those other Kinds of *Torch-like Plants*, which have milky Juice, and are reckoned of the *Euphorbium* Race. I do
not

not yet find that any of the *Torch-Thistles* grow in any other Part of the World but in *America*; nor can I learn that the *Euphorbium* are found any where naturally growing but in *Africa*. The *Torch-Thistle* are of two Sorts; some creeping upon the Ground, and the others growing upright to a great Height, without Support. The creeping Kinds are more inclining to branch than the others, and take Root easily as they run upon the Ground: The Branches of the creeping Kinds are differently shap'd, in that one Sort, pretty common in *England*, has a triangular Branches, and the other has its Sprouts divided into six or seven Angles; both these have the Edges of their Angles adorn'd with small tender Spines set together in the Form of Stars. The Flowers of the first I have not yet seen, but the latter has blossom'd in *England*, which yet perhaps it would not have done without an Accident: A large *Plant* of it that stood in the Neighbourhood of a plaister'd Wall, struck its Roots into it, and soon after, dying at its first Root, it remain'd some Time nourish'd by the Wall only, and in that Condition set for Flowering: The Blossoms were very large, radiated somewhat like the *Sun-Flower*, many of the *Petals* were of a yellow Colour, with some few, towards the Middle, of a fair White. This Flower stood upon the Summit of the Fruit, like those of the *Indian-Fig*; and when it opened, was extremely well scented, but soon decayed. Whoever considers that this *Plant* grows naturally upon Rocks, will not wonder at its Flowering when it grew in Lime-Mortar, which comes the nearest to the rock Soil of any we can compose.

I have therefore chose to plant both these creeping Kinds of *Torch-Thistles* in Rubbish of old Walls mix'd with about one Third of sandy Soil, and some small Pieces of Free-stone among it; for this Mixture will keep the Roots dry, and grow hard as a Rock, after it has been well water'd: These are both raised from Cuttings planted in this Mixture any Time between *May* and the End of *July*; but we must first observe, that they lye in the Sun for a Day or two after they are cut, to heal their Wounds, and not put them into the Ground before they are dry'd, which we must also remember to do with all Cuttings of *Succulent Plants*. Plant these as I direct for the *Aloes*, upon a little Hill in the Middle of the Pot, for they can hardly endure Water: Let them, after Planting, stand abroad about twenty Days to take Root before they are put into the *Hot-Bed*, for else they would be apt to shrink; and at first putting them in Pots, water them to settle the Earth, but with this Caution, that it be done when the Sun has Power enough to dry and harden the Mixture they are planted in. During the Summer, they may now and then be gently refreshed; but from the Middle of *September* till *May*, I would not advise any Water: Some have planted them in light sandy Soil, and they have shot well in the Summer, but would seldom live till the *Spring*: In a Word, keep them as dry as possible in the *Winter*, and let them have the open Air (after Rain especially) in the *Summer*, as much as you can give them; for 'tis what they chiefly feed upon, as we may know by their putting out of long *Fibres* from their Branches at such Seasons. This Kind of Plant comes from those Parts of *America* near the Line, therefore are not so hardy

hardy as *Aloes*, and should be kept more in the House, and set in the warmest Places.

The *erect* or *upright* Kinds, have generally much larger Stems or Branches than the others, and the *Spines* upon their Edges very strong, which are various in their Length and Colour, as the *Plants* they belong to are different; and the several Kinds of this *Plant* likewise differ in their Colour and Number of *Ribs* or *Angles*. The upright Sort, as I observe, never offer to put out any Branches, as long as their first Stem can preserve its Top from Damage; but as soon as that is cropp'd or injured, then they commonly put forth fresh Shoots near the Place where it was cut or broke off, about three or four in Number, which grow upright. Sometimes the great upright *Torch-Thistle* will continue growing in one Stem 'till it be near twenty Foot high, without putting out any Buds but those for Blossoms: The Flowers are radiated with whitish *Petals*, which do not open 'till the Fruit upon which they stand, seems to be full grown. This Kind, as well as the others of this Tribe, is easily raised from Cuttings planted in any of the Summer Months, but best in *May*: To cut a Stem of any of them into Pieces of six, or seven Inches long, and let them lye in the Sun 'till their Wounds are dry; every Cutting will soon take Root, if they be set in Pots of light Earth, and kept pretty dry, 'till they begin to shoot, and then some of the Mixture prepared for the creeping Kinds should be put to their Roots, and as much of the light Earth as possible taken away: The Reason why I do not chuse to plant them in this Mixture at first, is, because the Roots will more readily form themselves in the other Earth. When these *Plants* begin to grow, they will put out little Buttons near the Tops, which will

will afterwards form so many Stems, excepting only that Cutting which was the running Top of the *Plant*, and that will shoot upright. When the little Stems are about four or five Inches long, they may be cut; and after drying in the Sun, be planted like the others.

I can say no more concerning these *Plants*, than I have done of the creeping Kinds, unless it be, that what I call the *great upright Torch-Thistle* is easily preserved in any *Green-House*, and is not so hard to be kept as the others; that is, it will thrive better in a plain sandy Soil, than in the Mixture I have prescribed for the others of this Tribe, and will bear more Water in the *Summer*. The Figures of all these Kinds, I think, are nowhere cut but in my *History of Succulent Plants*.

The *Melon-Thistle*, or *Echinomelocactus*, is a very wonderful *Plant*; I have had only two Sorts of it, viz. the large Kind growing in *St. Christopher's*, and other *Caribbee-Islands*, which is cut in *Gerard's Herbal*; and the small Kind which is figured in the *Paradisus Batavus*, named in that Book, *Echinomelocactus minor Lactescens absque iumento Cylindris Strictioribus*.

The first is a solid *Plant*, growing out of the Ground like the Fruit of a large *Pumkin*, but ribb'd like a *Melon*, and very green; upon the Edges of each Rib are long Star-like Thorns, placed one above another, of a *Chocolate* Colour: On the Top of this *Melon-like Plant*, grows a large Lump of a Cotton-like Substance, cover'd over on the Out-side with short tender *Spines* of a *Cinamon* Colour; out of this bursts forth the Fruit (in a hot Day) full ripe, about the Size and Colour of *Cornelian Cherries*, and commonly drop off two Hours afterward. There is now one of these *Plants* in the *Stove* at *Hampton-Court*; it is

is called in *Barbadoes*, *Pope's-Head*, or *Turk's-Cap*.

The other Sort seldom exceeds the Bigness of a large *Apple*, growing out of the Ground like a solid Fruit, and covered over with little Knots, somewhat resembling green *Barberries* set close together, and little Stars of Thorns at their Points, of a *Cinamon* Colour; the Fruit of this, like the former, cracks out in hot Weather, full ripe, of the Shape and Colour of a ripe *Barberry*; but these remain upon the *Plant* a long Time. I could have been more particular about the Description of these strange *Plants*; but as they will be engraved and described in my *Decades of succulent Plants*, I shall therefore refer my Reader to that Account of them.

These both grow upon Rocks in *America*, near the *Line*, so that they are very tender; but being humour'd in their Way with a proper Soil, and kept dry, may be preserv'd as well as the *Torch-Thistles*. I have raised the small Kinds from Seeds sown in *Lime* Rubbish, which I afterwards preserved for some Time, but they were not hardy enough to resist the hard *Winter*. The best Way to provide ourselves with these *Plants*, is to have them brought from *America* well grown, and kept without Water during their Passage.

The *Indian-Fig*, or *Prickly-Pear*, is call'd *Opuntia*, and *Ficus-Indica*; there are many different Kinds of this *Plant* chiefly growing in *America*, from whence I have had about eight or nine distinct Sorts: This Race of *Plants* are said to grow one Leaf out of another, but they are rather Branches than Leaves; the Leaves properly being those little Buds which appear always on those Parts where the Thorns afterward put forth. However, since what I take to be Branches have generally been called Leaves, I shall yet
continue

continue that Name to them. This Tribe of *Plants* then, differ chiefly from one another in the Size of their Leaves, the Colour of their Flowers and Fruit, and the Length and Colour of their Spines; the Leaves of all of them are generally of an Oval-Figure; some Sorts have them near a Foot in Length; and others not more than two or three Inches; their Leaves are generally set with Knots of Thorns at certain Distances; some so very long, that the *Indians* make Use of them as Pins: Others have the Thorns so short, that they are hardly to be perceived, and those small Thorns make the *Cow-Itch*, and can hardly be got out of one's Flesh in a Month, if they are not carefully fought after at first: In this Tribe the Fruit always appears before the Flower; and when it seems to be full grown, the Blossom opens at the End of it, with about ten *Petals* and a Cluster of *Chives* in the Middle: This Flower always opens in the Heat of the Day, and shuts up when the *Sun* leaves it: When the Fruit is ripe it is generally of a strong red Colour, and has this Singularity in it, that if it be eaten, it will make the Urine of the Person as red as Blood, but without any ill Effect; the Flowers are commonly yellow, except one Sort which bears scarlet Blossoms, and is more tender and hard to be kept than any of the others, and very apt to rot: Some of them delight to creep upon the Ground, others grow more upright; but all of them delight in stony Places and Rocks, therefore I give them Earth made with Lime-Rubbish and sandy Soil in equal Quantities, planting them in Pots, as I do the *Aloes*, upon little Hills raised above the rest of the Earth; they may, for the most Part, be watered like the *Torch-Thistles*, and should have Warmth answerable to the Climates they come from

from. We have a small Sort which comes from *Italy* with round Leaves, that will stand abroad all *Winter*, and bear Fruit plentifully; and the *Carolina* Kind, and the *Virginia* Sort, will likewise live out of Doors under the Shelter of a warm Wall; these are all raised by planting single Leaves about two Inches deep, in Pots of the prepared Earth, (after their Wounds are dry'd) and letting them stand abroad 'till they strike Root, before they have the Help of a *Hot-Bed*: And I observe, to set them upon Leads, or some Stone Pavement, exposed to the Sun, contributes to make them shoot with greater Vigour: The Plantations of the Leaves should be made in the *Summer* Months, and they should be housed with the *Aloes*.

The *Ficoides* is a Plant so different from other Kinds, that Authors have greatly varied in the Name of it; some esteem it like the *Crisanthemum*, or *Corn-Marygold*; others make it a Diminutive of the *Opuntia*, or *Indian-Fig*, and, indeed it has this Likeness to the latter, that the Fruit is always formed before the Flower opens, and is not unlike a *Fig* in its Shape: The Flower is radiated somewhat like the *Marygold*, and therefore the *English* Name I gave it in my *Decades* of *Succulent Plants*, is *Fig-Marygold*, which in my Opinion, is a Name, in our Language, as proper for it as *Ficoides*. The Leaves of this Plant are always succulent, and it is rare to find one in this numerous Tribe that has not conjugated Leaves, that is, Leaves set on in Pairs at the Joynts.

In the Culture of fifty Sorts of this Plant, I do not remember to have met with one that was not a Native of *Africa*, chiefly about the *Cape of Good Hope*, from whence we receive them; they commonly grew in stony or rocky Ground, in such

such Places where they have not much Wet, and are easily propagated either from *Seeds* or *Cuttings*: The *Seeds* may have the Help of a moderate *Hot-Bed*, if they are sown early in the Spring; but the *Cuttings* being planted in a natural Bed of Earth in *May*, will prosper very well, and be fit to put into Pots the *August* following, in which Condition, they may yet remain abroad 'till about the 20th of *September*; for they delight in the open Air, and are not easily overcome with small Frosts. As to the Time of their Duration, I find many of the shrub Kinds require to be renewed every second or third Year, and likewise the running or creeping Kinds; for *Plants* of three Years old often drop off; or, if they live, are generally ill shapen and ragged. It is practised in some Places, to raise these *Cuttings* upon a Bed made with *Tanner's-Bark*, which is a Mixture that affords a gentle Heat for three or four Months, without ever burning; therefore it would be of great Use to raise young *Orange-Trees* upon, or other small *Plants*. Some Kinds of this *Plant* are annual, and therefore must be raised from *Seeds* every Year; as one Sort especially, which of late has been pretty frequent among us; it has, at first coming up, Leaves somewhat like those of the *Arrow-Head*, covered with little Blisters of clear Juice, which appear like so many *Diamonds*, and give a notable Lustre when the *Sun* shines upon the *Plant*; but as this *Plant* grows bigger, the Leaves grow smaller, and change their Figure; it puts out many Branches covered with transparent Blisters, and blossoms about *September*, bearing small white Flowers. But this, like other *Annuals*, will stand the *Winter*, if we raise young *Plants* of it about *July* or *August*, that do not attempt to blossom in three or four Months.

There

There is another Class of the *Fig-Marygold*, which are *Dwarfs* and *Aloe-formed*, growing always near the Ground without branching; most of them will remain five or six Years, without renewing, but may perhaps be subject to lose some of their Leaves lying next the Earth, if the Surface of the Earth is not covered with sifted Lime-Rubbish, which contributes to suck up the Wet, and keep the Leaves from rotting; these Dwarf Kinds have commonly the most succulent Leaves, and therefore are more endangered by Wet than the others; so that I always plant them upon little Hills in the Middle of the Pots, as I have advised for the *Aloes*: So likewise some of the creeping Kinds, that have very succulent Leaves and tender Stalks, should have the Top of the Earth they run upon, cover'd with a thin Coat of Lime-Rubbish, or Sea-Coal Ashes, to prevent their rotting by too much Wet: The Earth, for every Kind of this Plant, should be light and sandy, with about one fourth Part of Rubbish among it.

The *Shrub* Kinds, which have their Stalks woody, will bear moderate Waterings; but the others, which are most circulent must have very little Water. This Tribe of *Plants* should always have the Advantage of the *Sun*, for they will never open their Blossoms without it, excepting two or three Kinds, which only Flower in the Night. As I have already published the Figures of many of these *Plants*, and am still about engraving many more of them in the *History of Succulent Plants*, so I shall refer my Reader to that Work for their particular Forms and Uses. The *Cuttings* of these *Plants* should not be planted before their wounded Parts are dry.

We have great Varieties of *Sedums*, or *House-Leeks*, from the *Cape of Good Hope*, which are not less beautiful than the *Fig-Marygolds*, and are easily propagated by the same Means. Dr. *Commelin* has given us the Figures of several of them among his *Amsterdam Plants*, and therefore I shall say little relating to them; but the *Tree-Kind*, or *Sedum Arborescens*, which is the largest of them, I cannot well pass by, without taking Notice of it, as one of the most beautiful *Plants* belonging to the *Green-House*, especially that Sort of it which has its Leaves variegated with Green and Yellow, and also has very often those Leaves tipp'd with Purple: It loves a light sandy Soil, and is easily propagated from Branches set in the Earth in any of the *Summer Months*, giving them very little Water, and as much Air and Shade as possible in the *Summer*, and no Water at all in the *Winter*. I observè the Method I prescribe for them in the *Summer*, contributes to make them more beautiful in their Leaves than those that are drawn under Glasses, or exposed to the *Sun*, which is a common Error: In a Word, every *Plant* that feeds upon the Air, as this does chiefly, must be treated in the same Manner, if we have a Mind to keep them in their best Colours; for too much *Sun* to *Aloes*, and such like *Plants*, is apt to change the Colour of their Leaves.

The greatest Varieties of the *Euphorbium* that I have yet seen, are in the *Amsterdam Gardens*; they are in Shape, and Manner of Growth, very like the *Torch-Thistles*, but have not Star-like *Spines*; however, they do not want some Thorns to defend their Edges, which vary in their Figures as the *Plants* are different: All this Race abound in poisonous milky Juice, which
flows

flows from them in great Abundance when they are wounded; so that the Cuttings taken from them for Increase, must be well dry'd in the Sun before they are put into the Earth. The Mixture which I direct for the *Torch-Thistles* is the most proper for this Kind of Plant, which delights in rocky Soil, and requires very little Water: These are most of them very tender like the *Torch-Thistles*, and may be kept in the House all the Year about, and stand in the warmest Place of it: We may raise them in any of the Summer Months with the Help of a *Hot-Bed*.

The *Frittilaria Crassa* is a small creeping Plant, imitating in the Manner of its Growth, the *Torch-Thistles*, shooting one Branch out of another: It has neither Spines nor Leaves, that ever I could discern, but bears very large Flowers about four Inches over, speckled with Black and Yellow, like the Belly of a Toad; and one Sort has its Petals cover'd over with purpleish Hair or Wool: These Flowers, when they open, have a very ungrateful Smell like *Carrion*, and soon are cover'd with little *Insects* about the Centre of their Blossoms. The Stems of the smallest Sort are generally of a brownish Colour; but the larger Kind has its Stems very green, if the Plant be in Health: See the Figures of both these Kinds in the *Hort. Lugd. Bat.* and Dr. *Commelin's* Book of *Amsterdam Plants*: we may easily propagate these Plants by planting their Branches in a natural Bed of Earth, any Time between *June* and *August*, and they will soon be fit to plant into Pots; the most proper Earth then for them, is that directed for the *Aloe*: These Plants are very apt to rot, and therefore must be kept dry in the *Winter*, and have a warm Place in the *Green-House*.

I have now given my Reader sufficient Instructions for the propagating such *Plants* as are both delightful and profitable in a Garden ; and if he should meet with other Kinds than those I have mentioned, I doubt not but he may readily cultivate them, if he discreetly consults the Directions I have given him in this Work.

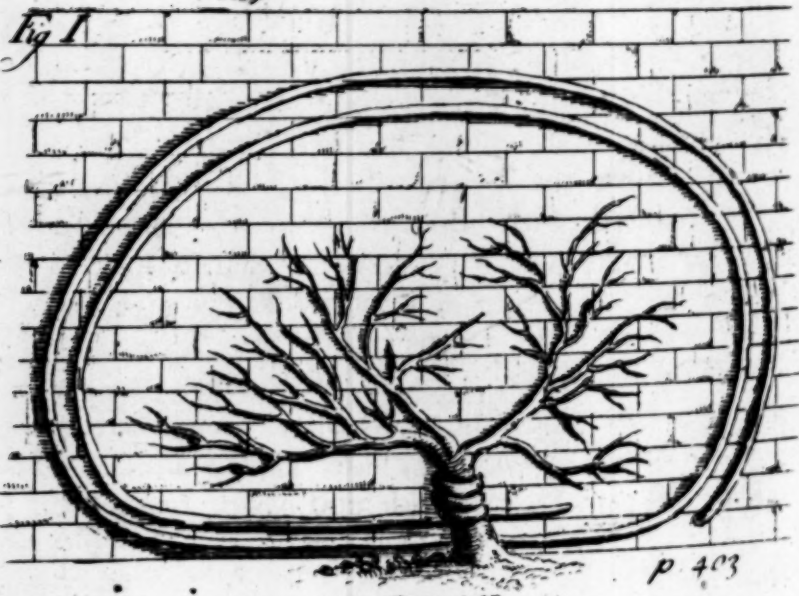


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Plate I





Monthly DIRECTIONS
For ordering the
KITCHEN-GARDEN
And for the Management of
FOREST-TREES.

JANUARY.

THIS Month is commonly frosty; and if we have any great Snow in the Course of the whole Year, it is about this Time. In this Month the *Thames* has been three Times frozen within the Space of forty Years, so as to be covered with Booths, bear the heaviest Carriages, and even to remain in that State for several Weeks: And it is observable, that the most piercing Cold reigns chiefly at this Season: Therefore whatever is nice and curious in our Gardens, must now be diligently look'd after, especially those *Plants* which are in *Hot-Beds*, by taking proper Means to defend them from the

cold Air, and covering the Glasses a little before Sun-set with Litter and Mats.

If a Gardener has any *Cucumber* or *Melon-Plants* in his *Hot-Bed*, he must be careful to give them Sun through the Glasses at every Opportunity, the better to keep them from the Injuries they will be apt to receive from the Steam of the Bed; for the Steam of the Dung, rising in a great Quantity at this Season, condenses upon the Glasses, and then dropping upon the tender Plants, rots them.

This injurious Steam may be corrected two Ways; *First*, By allowing at least six Inches thick of Earth to cover the Dung; and, *Secondly*, By contriving Frames of Woollen Cloth to slide in under the Glasses, which will receive the Steam that arises in the Night, and may be drawn out and dry'd every Morning, without any Injury to the *Plants*.

The Damps being corrected in this Manner, the Heat of the Beds may be recruited or preserved, by laying hot Dung to their Sides every fifteen or twenty Days.

Sow *Cucumber* and *Melon Seeds* on the *Hot-Beds* every Week, lest by some Accident the first *Plants* are lost.

Sow small *Sallads* upon declining *Hot-Beds*, viz. *Mustard*, *Radish*, *Cresses*, and *Lettuce*, allowing them what Air the Season will permit, when they are come up, for 'tis Air that gives them their right Taste.

Plant *Strawberries* upon a moderate *Hot-Bed* to make them bear Fruit betimes, but keep them not too tender.

If you have not yet planted any *Mint* upon *Hot-Beds*, 'tis now a proper Time to do it, that it may not be wanting in the *Sallads* of this Season.

Make

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Make a *Hot-Bed* for *Asparagus* to succeed that made in *December*. [See my *New Improvements*; Part III. under that Head.]

If the Weather be frosty, bring into the Garden such Manures as are necessary to enrich the Ground.

Continue to prune large *Orchard-Trees*, taking away the luxuriant Branches close to the Stem, and such as grow disorderly.

Towards the latter End, gather *Cions* for Grafts, from good bearing Trees, and lay them half way in the Earth till Grafting Season, or if they are to be sent to a remote Place, stick their Ends in Clay, and bind them together with a dry Straw-band.

It is now a good Time to remove large Trees, if the Weather be frosty; for then the Clod of Earth about the Roots will remain entire, without falling from them.

In open Weather, continue to trench Ground, laying it in Ridges till you use it.

Now also is a good Time to compose Earth, by mixing several Soils together of different Qualities, as Sand with Clay, &c. for such Soils are to be coveted before Dung, for *Trees* or other durable *Plants*.

Give fresh Earth to your *Sage*, *Thyme* and other sweet Herbs, taking Care that their Roots are not disturbed.

Uncover the Roots of *Trees* that are too luxuriant, cutting off some of their large Roots, as well to curb their too great Vigour, as to prevent their too early Blooming.

If in the preceding Month your *Strawberries* have not been dressed with fresh Earth, that Work must be no longer delay'd.

Towards the End, if the Weather be open, transplant all Sorts of *Timber-Trees*, having first prepared the Places for them, by digging and loosening the Earth; and, if necessary, mixing it with different Soil.

In wet and heavy Ground raise Banks of Earth, a convenient Height, to plant your Trees upon; but in dry sandy Ground that Labour may be omitted.

In planting of Trees have due Regard to the Manner of the Roots, that those which naturally spread near the Surface, be not planted too deep, but, as near as may be, imitate Nature in this and all other Garden-Work.

In planting Trees for Timber, always preserve the leading, or upright Shoots of the Trees, pruning off only the collateral Branches close to the Stem.

Chuse rather to plant small Trees than those of a large Size; a few Years will reward your Wisdom in so doing; for where Trees have stood long enough in one Soil to become large and stately, they are hardly to be reconciled to any other, though they could be transplanted without any Loss of their Roots.

Consider well the Soil and Exposure proper to each Tree you design to plant, and be not over-hasty in cultivating any particular Tree you most admire, without the Place be agreeable to its Nature; for 'tis the Want of such Consideration which has confounded many chargeable Plantations.

Sow some *Hotspur Pease* to succeed those sown in *November*; also set *Spanish Beans* in the open Field.

Set Traps for Mice and other Vermin, which are now very busy about your young *Pease*, and those you have newly put into the Ground.

Plant

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Plant *Cabbages, Turnips, Parsnips, and Carrots* for Seed.

Make up and enrich your *Hop-Hills*, allowing the Space of six Foot between the Centres of the Hills, raising each Bank a Foot higher than the Paths, if the Ground lye wet, or about half as much if it be dry; make them flat on the Tops, and about two Foot over, working the Earth very fine, to prepare it for planting the next Month; but if the *Hop-Garden* is already made, it is now the Season to lay Manure about the Edges of the Hills, and to lay upon them a thin Covering of fresh Earth.

Products of the Kitchen Garden in January.

CHARDONES are yet in great Perfection.

Roots preserved in Sand, which are now in Use are *Carrots, Parsnips, Beets* both Red and White, and *Potatoes*, with some *Skirrets*.

Roots yet remaining in the Ground are *Scorzonerra, Turnips, Horse-Radish*, and some young *Carrots*, which were sown in July.

The Roots kept dry in the House are *Onions, Garlick, Shallots, Rocambole*.

We have yet some *Artichocks* in the House, which were preserv'd by setting their Stalks in Sand.

Herbs for boiling are *Boor Cole, Savoy Cabbages, Sprouts of Dutch, and Battersea Cabbage, Red, and the Russia Cabbage, and Spinach*.

Herbs for Soup, and other Kitchen Uses are *Parsley, Sorrel, Chervil, Leaves of the White Beet, Leeks, Thyme, Sage, Winter-Marjoram, Clary, Sellery*, and by some are used the Tops of *Green-Pease*, and of *Asparagus*.

D d 4

Dry'd

Dry'd Herbs for Household-Use are *Marygold Flowers*, *Sweet-Marjoram*, and dry'd *Mintb*.

Sallads for this Month are composed of the Tops of *Mintb*, young *Cresses*, *Mustard*, *Radish*, young *Lettuce*, young *Onions*, *Sellery*, and *Endive*, the Tops of *Burnet* and *Chervil*; to which Mixture we may add a *Cabbage Lettuce*, preserved under Glasses, or some of the *Dutch Brown Lettuce*, which was sown abroad at the End of *August*, and is now a little curl'd, and very agreeable among *Sallad Herbs*.

We have Plenty of *Asparagus* upon the *Hot-Bed* made for that Purpose in *December*.



Works to be done in the Kitchen-Garden in
F E B R U A R Y.



THIS Month has been commonly reckoned the wettest in the whole Year: And I have observed, we rarely have any lasting Frost begin at this Season; but have taken Notice, that when *January* has given us a good Share of Frost and Snow, the Weather in this Month is commonly warm and pleasant; and if that happen, 'tis an admirable Time for planting of Trees, either for Fruit, Timber, or Ornament, if those Works were not compleated in *September* and *October*.

Elm-Sets should now be gathered from the Roots of large Trees, and planted in Nursery-Beds, and young Plantations provided of all Sorts of *Forest-Trees* and *Shrubs*, which are propagated from Slips or Layers.

Set

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Set *Acorns* of the *Ilex*, *Cork-Tree*, and *English Oak*, *Chestnuts* and *Walnuts*, and sow the *Samara* of the *Elm* and *Bay-Berries*, all which come up the first Year.

Sow the *Mast* of the *Ash*, *Beech*, and such other *Timber Trees* as has been prepared a Year in *Sand*, for else they will be two Years in the *Ground*; as also the *Berries* of the *Hawthorn*, *Yew*, *Holly*, and such *Evergreens* prepared as above.

What I here mention concerning the preparing of *Seeds* in *Sand*, is the common Practice of the *Gardeners*; but I am informed by *Mr. Furber*, a *Nursery-Man* at *Kensington*, that he sow'd *Holly* and *Yew-Berries*, which were two Years old, and had not been prepared that Way, which came up the first Year without *Difficulty*: And he adds, That he gathered *Ash-Keys* in the *Spring*, and sowed them immediately, and they came up in like Manner; which I have done with the like Success: But this is nothing extraordinary, seeing that the *Ash* will frequently hold its *Keys* two Years, without letting them drop, and at that Age they are prepared of themselves to grow without any *Artifice*.

Another has told me, that *Holly-Berries* being gather'd, and laid in a large *Heap* in the *House*, without stirring them 'till *Spring*; then those which lye in the *Middle* of the *Heap*, will not only be void of their *Pulp*, or *fleshy Part*, but be sprout-ed; and then being immediately sown, will come up in a *Month's Time*. This may happen perhaps from the *Ferment* which the *Berries* would raise when they began to sweat; and it is from the same Reason I have recommended the Tryal of the *Bran* and *Water*, in my *New Improvements*, Part II.

Prune

Prune and nail your *Apricots* and other Stone-Fruit at the Beginning of the Month, and last of all your *Nectarine*.

About the Middle of the Month, sow *Beans*, *Pease*, *Parsley*, *Spinach*, *Carrots*, *Parsnips*, some *Turnips*, *Scorzonerra*, *Onions*, *Leeks*, some of the *Dutch Brown Lettuce* and *Radishes*.

Sow *Skirrets* in light, rich Ground, where they may have some Moisture. It is held by some, that when the Roots are about two Inches long, they should be transplanted, to make them large.

Plant *Garlick*, *Shalots*, and *Rocamboles*, for Increase, in light Ground.

Set *Potatoes*, and *Jerusalem Artichokes*.

Transplant young *Cabbage-Plants* for a Crop, if that Work was not done in the preceding Month.

Sow *Asparagus Seeds* in the natural Ground.

Towards the End, begin to graft in the Cleft, *Apples*, *Pears* and *Cherries*.

Renew the Heat of your Hot-Beds with fresh Dung, and continue to sow *Cucumbers* and *Melons* every ten Days, for fear of Danger from the Weather.

Now also make a Hot-Bed for all Sorts of Annual Seeds, except *African*, and *French Mary-golds*, which may remain unsown 'till the next Month, otherwise, they would grow too big for the Frames before the Weather would permit them to stand Abroad.

Sow some of the *Battersea Kidney Beans* upon a Hot-Bed, to have *Beans* in *April*, and raise some *Purslane* upon Hot-Beds.

Now it is proper Time to make a *Mushroom* Bed, covering it with Litter, at least eight or ten Inches thick; the *Mushrooms* will begin to appear in a Month's Time after making the Bed,

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Bed, if the Dung is not covered too thick with Earth.

Plant *Hops* this Month, seven Plants on each Hill; observing, that each Set or Plant has not more than two Joints; for if they were to have a greater Number, the Shoots would be too weak.

Now make a large Hot-Bed for forward *Radishes* and Spring *Carrots*, which may be sown together, for the *Radishes* will be fit to draw in March, and be quite gone before the *Carrots* begin to swell: This Bed must be cover'd about eight Inches thick with Earth, and defended from the Weather with Mats, supported upon Hoops; for Frames and Glasses would draw the *Carrots* too much into Leaf.

Sow some *Collyflower Seeds* towards the Middle of the Month, upon some declining Hot-Bed.

Towards the End, sow *Parsley*, in the natural Ground.

Make Plantations of *Strawberries*, *Rasberries*, *Gooseberries*, *Currants* and *Roses*.

Plant yet *Vines* and *Figs*, *Honyuckles*, *Jessamines*, &c.

Product of the Kitchen-Garden in *FEBRUARY.*

WE have yet some *Chardones*.

We have still some *Turnips*, *Parsnips*, *Beets*, *Potatoes*, *Skirrets*, *Scorzonerra*, with some young *Carrots* sown in July.

Asparagus in Hot-Beds now much better than in the preceding Month.

The Herbs for Kitchen Use are those mentioned in *January*,

Herbs

Herbs for boiling, are *Red Cabbages*, *Sprouts of Cabbages*, and some few of the *Savoy-Cabbages*, *Spinach*, and the *Leaves of the White-Beet*.

Sallads of this Month consist of the same small Herbs as in the preceding; but we may now add *Water-Cresses*, and blanch'd *Dandelion*.

The *Cucumbers* sown in *October*, if they have withstood the Rigour of the *January* Frosts will towards the End yield us some Fruit; and the *Kidney-Beans* which are sown at the same Time, will now afford us Plenty of *Beans*.

Some *Cherries* are commonly ripe this Month, at Mr. *John Millet's*, a curious Nursery-Man at *North-End* near *Fulham*, and green *Apricots* may be now found at the same Place.



Works to be done in the Kitchen-Garden in
MARCH.



THIS Month is generally attended with white Frosts in the Nights, hasty Storms of Hail and Rain, and the Winds from the *East* and the *North-East* are now very hurtful to our blossoming Fruit-Trees. The Showers which fall at this Season wound and bruise such tender Plants as stand Abroad; so that a Gardener must now be very watchful to defend and shelter his Trees and Plants from the Injuries of the Weather. The Sun has now great Power over Plants, when it is not interrupted by Storms; and the piercing Winds concurring with the hot Gleams which are now frequent, scorch and rivel the tender Shoots of such Plants as now begin to sprout un-

less

less they be happily guarded. All young planted Herbs or Trees should be carefully water'd, altho' we have many brisk Showers at this Time, for they reach not deep in the Ground; and we must observe, that whatever we water now, must be in the Morning, for else the Frosts coming too suddenly upon the new water'd Plants, would chill their Roots.

If we have omitted any of the Works directed to be done in the former Month, they must not any longer be delay'd; for by the End of this Month our Garden ought to be compleatly cropp'd.

Continue to sow *Radish*, and *Silesia*, *Imperial*, and *Cabbage Lettuce* among all the Crops you put into the Ground, for they will come to Perfection, and be gathered before the other Roots and Herbs cover the Ground.

Sow *Scorzoner*, *Salsify*, and slip *Skirrets* of the last Year, leaving only the tender Fibres, and not any of the greater Roots about the Plants.

Sow *Pease* and *Beans*.

Make Plantations of *Mint*, *Balm*, *Pennyroyal*, *Thyme*, *Savory*, *Sage*, *Tanzey*, *Rue*, and other durable Herbs for Household Use, except *Lavender* and *Rosemary*, which will grow better if they are set in *April*.

Plant out some *Collyflower* Plants to succeed those planted in *Autumn*.

Toward the Middle, rake and dress your *Asparagus-Beds*, for early in *April* the Buds will begin to appear above Ground; and therefore if we delay this Work 'till the End of *March*, many Buds must then necessarily be broken off.

To make new Plantations of *Asparagus* in the natural Ground, first trench the Earth, and lay a good Coat of Dung at the Bottom of the Trench, covering it over with Earth, about six or eight
Inches

Inches thick ; and when the whole Piece is thus prepared and levelled, begin your Plantation, allowing ten Inches Distance between the *Asparagus Plants*, and four Lines of *Plants* in each Bed, leaving two Foot between the Beds for the Alleys, and then sow the whole with *Onions*.

Sow young *Sallads* in some warm Place, adding to the small Herbs of the last Month *Spinach*, *Rape* and *Sorrel*.

Sow *Cabbages* and *Savoys* for a Winter Crop, and some *Sellery* for early blanching : Sow also some *Collyflowers* on a declining Hot-Bed.

Sow *Chardones* to transplant the next Month.

Now dress the *Artichokes*, leaving only three or four Suckers on each strong Root, slipping off the rest for transplanting and making good the Defects in the old Plantation.

Refresh the *Cucumber* and *Melon* Beds with hot Dung, and sow now for a full Crop.

Transplant *Lettuce* for Cabbaging, and to stand for Seed. Carefully stake up all new planted Trees, to defend them from the Violence of the Winds, which now reign.

We may yet plant *Timber-Trees* of all Sorts, watering them well as soon as they are planted.

Sow the Seeds of the *Scotch Fir*, a Plant much neglected in *England*, but of admirable Use and quick Growth, They will thrive best in sandy Soil, such as are most of our Heaths in *England*. The Roots run near the Surface, therefore they will not bear planting deep. If any affirm they will grow in a stiff Soil, I acknowledge it; but I am persuaded, whoever has seen them in one and the other Sorts of Soil, will allow, that the Ground I direct for them, is at least one Third more Advantage in the Growth of the Tree than the other.

Sow

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Sow *Leeks, Beets, Chervil, Spinach, Fennel, Dill, Burnet* and *Sorrel*.

Sow *Endive* very thin, or it will run to Seed.

Divide the Root of *Tarragon*, and transplant the Slips about eight Inches apart.

Make young Plantations of *Cbives*.

Towards the End, sow upon the Hot-Beds some *Purslane, Nasturtium, French* and *African Marygolds*.

Sow *Marygolds* in the natural Ground.

Be diligent this Month in destroying Weeds before they run to Seed; for should their Seeds once shed in the Garden, it is more than a Summer's Work to get them out.

In the *Hop-Garden* prune all the strong Leaders to two Joints apiece, and take away all the young Shoots close to the Roots, leaving only those which shoot from the old Wyars.

Products of the Kitchen-Garden in MARCH.

THIS Month affords us very little Variety of Herbs for the Table, for now the Winter Stores are almost spent, and the Roots, which have been hitherto useful, are hard and stringy; and besides, an understanding Gardener must, at this Season, new crop his Ground with Herbs and Roots for the succeeding Months.

The only Herbs now good, are Sprouts of *Cabbages*, young *Cabbage-Plants*, or *Coleworts*, and some of the *Winter-Spinach*.

The Roots, are *Carrots*, sown in *July*, *Radishes* of *Michaelmas*, some few *Turnips* that were sown late, and *Red Beets*.

In the Hot-Beds we have *Kidney-Beans* and some *Pease*, besides *Cucumbers* upon the Plants raised in *January*.

Asparagus

Asparagus upon the Hot-Bed made in *February*, is now much better tasted than what we cut in the preceding Months.

Towards the End, the *Radishes* sown upon the Hot-Bed in *February*, will be fit to draw.

We may now add to the *Sallads* of the foregoing Months some *Purslane*, with young *Tops* of *Tarragon*, of which a few Leaves will serve to give a Relish to a large *Sallad*.

Hop-Buds, or *Tops*, are now gathered to boil, and are not much inferior to *Asparagus*.

Ripe *Cherries* and green *Apricots* may now be had, in great Plenty, at Mr. *Millet's* before-mentioned.

At the End, we have some *Scarlet Strawberries* ripe upon the Hot-Beds, and also some few *Beans*, if we have had Courage enough to forward them by artificial Heats, but that Trouble and Expence rarely turns to Account.

The Stalks and tender Sprouts of *Turnips* running to Seed, are now excellent after the Strings are taken from them; these in the Market are called *Lupines*, and are generally esteemed one of the best boiled *Sallads*.



Works to be done in the Kitchen-Garden in
A P R I L.



HE Weather is commonly unsettled in this Month, the Nights frequently frosty, and blighting Winds from the *East* are yet to be expected. The New Moon of this Month, which the *French* call the *Ruddy Moon*, is for the most Part

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Part attended with destructive and violent Winds, which endanger the tender Sprouts of Plants, and young knit Fruit; therefore Gardeners ought to be careful how they yet expose any House Greens or *Exoticks* to the open Air, or depend too much upon the fair Promise of a warm Day or two.

If the Weather be dry and windy, stake up all new planted Trees, if that Work was neglected in the preceding Month; watering them well once in ten Days; and fence your spired seedling *Onions* from the Winds, for they are easily broken.

In dry Weather, and light Earth, set *Kidney-Beans*, about three Inches apart, in Lines, each Line two Foot distant from the other, for nearer than that they would not thrive.

Now also set *Ronceval Pease*, and plant *Beans* to succeed other Crops; also where *Beans* have been set too thick, cut down every other Row within three Inches of the Root, and they will produce a good Crop in *Autumn*.

Now is the best Time in the whole Year to plant Cuttings or Slips of *Rosemary* and *Lavender*, especially after Rain; and, if omitted in the last Month, we may yet plant Slips of *Thyme*, *Sage*, &c.

Sow *Spinach* for the last Time in some moist Place, not too much exposed to the Sun, for else it would soon run to Seed.

It is now that our Gardens begin to be over-run with *Snails* and *Slugs*, to the great Destruction of our young knit Wall-Fruit, and the Greens of the Kitchen-Garden. Many Ways have been prescribed to remedy this Evil, as to lay *Tobacco-Dust*, *Soot*, *Saw-Dust*, or *Barley Chaff* round about the Stems of *Plants*, which indeed will keep them off for a little Time; but the first Rain that falls, gives them full Liberty to pass over these Fortifi-

fications; neither are we more successful in putting *Tar* upon the Stems of Trees, for a few warm Days dry it up: But the most ingenious Contrivance to keep off this destructive Vermin, that I have ever met with, I learnt from my curious Friend *Carleton Goddard*, Esq; which is so cheap and easy, and so much to the Purpose, that I believe few Lovers of Gardens will be without it.

He directs to wrap about the Stem of a Tree, two or three Rounds of Line, or Rope, made of Horse-Hair, such as are commonly used to hang Cloaths upon; these are so full of Stubs and stragling Points of the Hair, that neither a *Snail* or *Slug* can pass over them, without wounding themselves to Death; so that the Head of the Tree, if it be a Standard or Dwarf, can receive no Harm from them, if we secure the Bottom of the Stems. But to secure a Wall-Tree, we must yet use a little more Caution; for besides preventing their Passage up the Stem of the Tree, we must fasten one of these Ropes close to the Wall, so as to inclose all the Branches of the Tree, and allow Space enough to nail up the Summer Shoots within the Compass of the Hair-Line, as in *Fig. I.* where we may find that the Line is so disposed, that as the Tree increases in Bigness, and spreads more and more upon the Wall, the same Rope may be altered to serve for several Years.

In *Espaliers* of Fruit-Trees, it is only necessary to wrap these Hair-Lines about the Stems of Trees near the Roots, and about the Bottom of every Stake, which Work should be done in the *Winter*, when the *Snails* are laid up in their close Quarters.

To preserve *Collyflower Plants*, or other tender Herbs, which are liable to be destroyed by *Slugs* or *Snails*, the Hair-Lines may be fastened about the

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the Edges of the Beds they are planted in. It is to be remarked, that these Lines are best for this Use, when the Hair they are made of is very short, for then they will be full of Points, and compleatly arm'd against any Attempts of these murdering Vermin.

Sow *Cabbage-Lettuce* to succeed those sown in the former Month.

The Ground is now in good Order to receive the Seeds of *Thyme*, and such like Aromatick Herbs; and this Work should not be delay'd longer than the last Week in this Month. *Note*, All small Seeds must be sown shallow in the Earth, and the larger Kinds deeper in Proportion; and again, as the Ground is more light and sandy, every Sort must be sown deeper in heavy Soils.

Sow *Purslane* upon the natural Ground, and towards the latter End sow likewise some Seeds of the *Nasturtium Indicum*, if the *Hot-Beds* are not already provided with young *Plants*. Sow small *Sallads* in open Borders, as *Cresses*, *Spinach*, *Mustard*, *Turnip*, or *Rape* and *Radish*.

We may continue to make Plantations of *Strawberries*, till the Middle of the Month, placing the *Plants* about eight or ten Inches apart.

If the Weather be moist, it is not yet too late to make Layers of *Jessamine*, *Honeysuckle*, *Roses*, and such like Shrubs.

Sow *Sellery* upon the natural Ground, or upon some decay'd *Hot-Bed*, to succeed that sown in *March*.

Sow now *Spanish Chardones* in the natural Ground for a second Crop, making Holes for the Seeds about five or six Foot distance; put four or five Seeds in each Hole, and when they are come up, leave growing only one strong *Plant* in a Hole for blanching.

Towards the End, hough *Carrots*, *Parfnips*, and *Onions*, leaving the two first about five or six Inches distant from one another, and the latter about three or four.

Make Ridges for *Cucumbers* and *Melons* for a full Crop, and prune off the superfluous Branches from the *Melon Plants* upon the forward Ridge: But do this carefully, without lifting up the Runners from the Ground; for the least Disturbance of that Kind is apt to bruise the tender Branches, which often ends in the Loss of the whole *Plant*.

Near the Beginning set up the Poles in the *Hop-Garden*, placing three or four in each Hole, as the Strength of the *Plants* require. At the same time lead the Wyars, or Runners of the *Hop-Vines* to the Poles; and, if need require, tie them up with Bafs. 'Tis now all Weeds should be destroy'd before they run to Seed, to prevent an endless Trouble which they would create, if their Seeds were once suffer'd to shed.

If we have given timely Assistance with artificial Heats to those *Vines* planted against the forward Frames, we may now expect their Fruit to set; and it is then a proper Time to pinch off the Buds of the bearing Branches two or three Buds above the Fruit; for we must consider, those *Plants* which are forwarded by Artifice, do not depend upon the same Seasons as those do which are under the common Law of Nature.

Water well your *Strawberries* while they are in Blossom, two or three Times a Week, if the Weather be dry; this must be done in the Morning.

Products of the Month of APRIL.

FOR boiled *Sallads*, we have young *Carrots* sown in the foregoing *Autumn*, as also *Winter Spinach*: We have yet some *Sprouts* from the old Stems of *Cabbages* and *Colewarts*; or young *Cabbage-Plants*, or *Radish Tops*, in this Scarcity of boiling-Greens, are used by many, and are not to be despised: But, what is preferable to all, there is *Asparagus* now in great Plenty upon the natural Beds, making its first Appearance in the Gardens near *London*, about the third or fourth of this Month, and in those Parts of *Devonshire* lying near the Sea, above a Fortnight sooner; which I mention here, that we may the better judge, how much a Degree's Difference *South* or *North* between one Place and another, will forward or keep back the Growth of a *Plant*. We have now some *Sprouts* or *Collyflowers*, which begin to run to Seed, as they often will do, if the *Winter* has been mild: They eat very well.

Young *Radishes* are now very plentiful, and some of the *Dutch Brown Lettuce*, which has stood the *Winter*, will cabbage towards the End.

The small Herbs for *Sallads* upon the natural Ground, are *Cresses*, *Radish*, *Turnip*, *Spinach*, and *Mustard*; and the other Herbs proper to mix with them, are *Burnet*, *Taragon*, and young *Onions*. Upon the *Hot-Beds* we have now also some young *Purslane*.

About the End, the *Kidney-Beans* which were sown in the Middle of *February* upon a *Hot-Bed*, will be fit to gather.

We have Plenty of *Cucumbers* upon the *Hot-Beds* made for that Purpose, about the Beginning of *February*, and *Mushrooms* upon the Beds made about the same time.

We have now *Scallions* and *Leeks*, and sweet Herbs growing of all Sorts, except that which is call'd the *Summer Sweet Marjoram*.

Ripe *Cherries*, and large green *Apricots* are now in Plenty at Mr. *Millet's* aforesaid, and ripe *Strawberries* upon those *Plants* which have been assisted with a *Hot-Bed*.

We have *Green Gooseberries* for *Tarts*.



*Works to be done in the Kitchen-Garden in
M A Y.*



ALTHOUGH in this Month the Season is so far advanced, as to bring many Plants to their highest Perfection, and Nature seems to be dressed in her Wedding-Garment, the Garden is yet subject to many Hazards from frosty Nights and cold Blaſts, which oftentimes happen in the first fifteen Days. It is not many Years since a great Snow fell in the first Week of this Month; and though Snows are uncommon at this Season, yet the Showers which frequently fall towards the Beginning, are often mixed with Hail, which I account the most pernicious Offspring of the Weather, with respect to Vegetables; for their Leaves and young Fruit are then tender, and very subject to bruise by every little Accident of that Kind. It has been a Rule among the Gardeners about the Middle of this Month to expose or bring Abroad their exotick Plants,
and

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and such tender Shrubs as the Uncertainty of the Weather in the preceding Months confined within Doors ; and I have observed, we seldom have any Weather so unfavourable to Plants after the fifteenth, as to do them any Prejudice.

If ill Weather, or other Accidents, has prevented a Gardener from performing what I have recommended for the Works of the last Month, let him delay them no longer than the first Week in this ; for now the Season is so far advanced, that a Day lost is equal to a Week in *January, February, or March.*

Now look to your *Melon* Ridges, as well those made in *February*, as those which were planted in the last Month, weeding them, and carefully pruning off the Water Branches, which are known by their Flatness, and extraordinary Breadth : It is also advisable to pinch off the Tops of such Runners as have Fruit upon them, leaving three, or four Joynts always beyond the Fruit, and particularly taking Care, that every Fruit be sufficiently shelter'd with Leaves ; for to expose them to the Sun, while they are small, spoils their Growth. *N. B.* A *Melon* is about forty Days between the Time of its setting, and ripening ; and as I prescribe that Fruit to be shaded by the Leaves, during the Time of its Growth ; so, when that is perfected, we cannot expose it too much to the Sun for ripening, if we would have it well tasted.

If the Season be dry, rather float the Alleys between the *Melon* Ridges, than pour Water upon the Plants, or near the Stems ; for the Use of Watering is to feed the extream Fibres of the Roots, which are the only Parts of a Plant by which it receives its Nourishment ; and these Fibres in *Melon*, and *Cucumber* Plants always run

as far as the Branches : The Inconveniencies which attend the wetting the Leaves or Stems of these Plants, are either, that they rot or mould by the Wet lying upon them, or else they are scalded if the Sun shine hot.

The Water for this Use should be as simple as possible ; for all Waters prepared with hot Dungs, breed Insects among the Plants, which often destroy them. Pond-Water, which lyes exposed to the Sun, I take to be the best, and even that ought to be given but in small Quantities to a *Melon*, for much Wet spoils its Flavour ; but *Cucumbers* are great Lovers of it.

The Beginning of this Month sow *Cucumbers* in the natural Ground, about twelve Seeds in each Hole, for fear of Disappointments, but leave only four or five when they are come up. Let the Earth be fresh and well work'd with a Spade, rather light than otherwise, for in stiff Soil the Fruit is to suffer by Worms. This Sowing will afford us Plenty of Fruit in *July*, as well for Pickling, as to eat with *Sallads* ; a Plantation of this Kind producing near twice as much Fruit as one of the same Quantity of Ground forced with Dungs.

Sow some of the *Dutch Brown Lettuce* to be planted out the next Month for Cabbaging. We may also replant *Imperial* and *Silesia Lettuce*, if we have any large enough for that Purpose. If any of the *Imperial Lettuces* are cabbaged, cut the Tops of them cross-wise, that the Flower-Stems may have Liberty to shoot, in order for seedling. Sow yet some *Radishes*.

Transplant *Collyflower Plants*, and make your first Drills for *Sellery*, if your *Plants* are large enough.

Sow

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Sow *Ronceval Pease*, and towards the End, earth up and stake those which are sown in the former Month.

We may now sow some *Endive* very thin, to be blanched without transplanting.

Sow *Purflane* upon the natural Ground, and *Cabbages*.

Gather carefully the Nests of *Caterpillars* and other Insects which annoy your Trees, and prune off all crumpled Leaves and Twigs: for they harbour the worst of Vermin, although they are scarce visible without the Help of *Microscopes*: This Work is the more necessary, because every Insect increases yearly about 400, and some of them many more; for Example, those *Caterpillars* which feed upon the *Cabbage*, and change into the common white Butterflies, breed twice every Year, each of them laying near 400 Eggs at one Time; so that from the second Brood of one single *Caterpillar*, we may reasonable expect 160,000.

Continue to destroy Weeds before they shed their Seeds, and particularly those Kinds which have feather'd Seeds, such as *Dandelion*, which are carried by Winds to every Quarter of the Garden, and are hardly to be rooted out when once they get Possession.

Products of the Kitchen-Garden in MAY;

THE Kitchen-Garden now affords us many pleasing Varieties both of Fruits and Herbs.

Asparagus is now in great Plenty, and *Collyflowers* are now in their greatest Perfection.

The *Imperial*, *Royal*, *Silesia*, and many other Kinds of *Cabbage-Lettuces*, are in their Prime, and

426 *Monthly Directions for* [June,
and vety proper *Sallads* for this Season, with
Mixtures of young *Burnet*, *Purflane*, the Flowers
of the small *Nasturtium*, and *Cucumbers*; for the
small Herbs, which were the *Sallads* of the last
Month, are now to be laid aside, as they are apt
to run into Leaf almost as soon as they are above
Ground, and are too hot for the Weather.

We have yet some *Kidney-Beans* upon the *Hot-Beds*.

This Month we gather *Pease* and *Beans*, from
those sown in *October*, and have Plenty of *Arti-
choaks*.

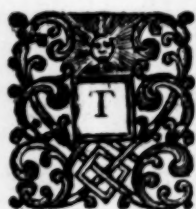
We have now green *Gooseberries* for Tarts.

The *Carrots* sown upon the *Hot-Beds* in *Febru-
ary* are now very good, but those remaining of
the Crop sowed at *Michaelmas* are hard, and good
for nothing. *Spinach* is yet for Use.

Towards the End, we have some *Scarlet Straw-
berries* ripe, in the natural Beds, and the common
May-Cherry, with some few of the *May Duke-
Cherries* against Walls, and also green *Apricots*
for Tarts.

This is the most proper Month for distilling
of Herbs, which are now in their greatest Per-
fection.

Works to be done in the Kitchen-Garden in
JUNE.



HE Method I have taken in the pre-
ceding Sheets, in giving a short Ac-
count of the Weather, which may
reasonably be expected in every
Month, was chiefly design'd to stir up
the Gardeners to a necessary Care of their Planta-
tions

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tions as are the most subject to be injured by uncertain Seasons: But as in the foregoing Months it required our greatest Skill and Diligence to guard against Frost, so now we ought with the greatest Application, to use proper Methods for defending our Plantations from the too violent Scorchings of the Sun, and have a watchful Eye upon such *Plants*, especially as have been lately transplanted, and refresh them with moderate Waterings about their extream Fibres; for to give them Water too near the Stem, does them little Good; this Work ought now to be done in the Evenings.

Continue to mow Grass-Walks early in the Morning, and after Rain.

Sow some *Lettuces* for Cabbaging and replant others which are large enough for that Purpose.

We may yet sow *Radishes*, and some *Endive*.

Continue to destroy Weeds as in the former Months.

It is now a proper Time to clip our Edgings of *Box*, &c. especially after Rain; but if the Weather be dry, gather Herbs for drying, to lay up for *Winter Use*; those are commonly *Sage of Vertue*, *Mint*, *Carduus*, *Sweet Marjoram*, *Thyme*, *Lavender*, *Rosemary*, and the Flowers of *Marygolds*.

About the twentieth, transplant *Leeks* in light rich Ground, about six Inches apart.

Cut no *Asparagus* after the first Week in this Month, for it will impoverish the Roots.

The Season is now very proper for budding or inoculating of *Peaches* and other Stone-Fruits.

Sow *Kidney-Beans*.

Set some of the *Ronceval Pease* about four or five Inches apart; these will afford a good Crop in *September*.

Now

Now look to your *Espaliers* of Fruit-Trees, and lay in good Store of Branches, as well to supply Vacancies, as for Fruit-bearing.

Products of the Kitchen-Garden in JUNE.

AT the Beginning we have some *Asparagus*, but I cannot advise cutting them after the first Week.

We have great Plenty of *Garden-Beans*, *Pease*, and *Kidney-Beans*: *Collyflowers* are now in great Perfection; and some of the *Battersea* and *Dutch Cabbages*, will be fit to cut towards the Beginning of the Month. We have also great Plenty of *Artichokes*.

We begin to draw some young *Carrots* and *Onions* that were sown in *February*, and some young *Parsnips*.

Sallads for this Month are composed of *Purslane*, *Burnet*, the Flowers of *Nasturtium Indicum*, and *Cabbage-Lettuces* of several Kinds, viz. the *Dutch Brown*, the *Imperial*, *Royal Silesia*, and *Coss Lettuces*, with some blanch'd *Endive* and *Cucumbers*.

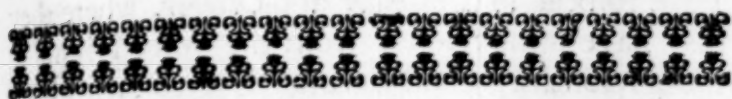
The Flower Stems of *Burrage* and *Burnet* are now good in cool Tankards.

The Pot-Herbs in Use in the preceding Month are still good.

We have green *Gooseberries* for Tarts till about the End of this Month.

The ripe Fruits are *Strawberries*, *Cherries*, of many Kinds, as the *Duke*, *White*, *Black*, and *Red Hearts*, the *Flemish* and *Carnation Cherries*, some *Raspberries*, *Currants*, and *Melons* of the first Ridges. Also we have *Codlins* now fit for Use, and towards the End some *Junitings* and the *Masculine Apricots*, and in the forcing Frames (if we have

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have any) all the forward Kinds of Grapes are
ripe.



Works to be done in the Kitchen-Garden in
J U L Y.



WE are now arrived at that happy Season, which affords us almost every Variety the *Kitchen-Garden* can produce. If the Gardener has been diligent in the preceding Months, he now meets the Reward due to his Skill and Labour. We have little Rain at this Time, and the Weather very hot; therefore our greatest Care must be to water carefully all new planted Trees and Herbs, so as to nourish their outward Fibres, as I have before directed. The Hours of general Watering in this Month are from five in the Morning until eight; and from five in the Afternoon 'till eight or nine in the Evening; but in particular Places, which have the Benefit of some Wall or Hedge to shade the Sun from them, we may take other Times of the Day, observing the Motion of the Sun, that his Beams do not reach them 'till at least two Hours after watering; for the extream Heat of the Sun at this Time of the Year would scald a new-water'd *Plant*, if we do not allow a sufficient Time for the Moisture to sink into the Ground, before the Sun come upon it.

Trust not too much to the sudden Showers which may now fall, for they are of little Help to the Roots of *Plants*; neither neglect to water those *Plants* which stand Abroad in Pots or Cases, for they have yet less Benefit from the
Rains

Rains in this Season, than the *Plants* in the open Ground.

The first Week sow *Kidney Beans*, and some *Pease* to bear in *September* and *October*, where they may have some Shelter from the frosty Nights in those Months. And have an Eye to such Herbs as are now seedling: Water them plentifully, for about this Time the Seed-Vessels of many are forming, and a good Watering or two is very helpful to the filling of the Seed.

Delay not to gather such Seeds as are fully grown and coloured in their Husks, pulling up the whole *Plants*, and setting them upright in a Green-House 'till the Seed-Pods are dry; for were we to wait 'till the Husks open, before we gather them, great Part of the Seed would be lost. This Way of gathering Seed is commonly practised; the Moisture in the *Plants*, and a little Sun, will perfect the Seeds, and they are subject to no Hazards from Birds or Wet.

The first Week sow *Cucumbers* upon a Bed made with dry Horse-Litter, covered with light Earth ten Inches thick; these will begin to blossom in *September*, and must then be covered at Night with a common Frame and Glass, to keep them from Frosts, and cold Rain. By this Method you may have *Cucumbers* 'till *Christmas*.

Sow *Royal*, *Silesia*, and *Brown Dutch-Lettuces* about the Middle of the Month, some of which will be cabbaged for *Winter* Use, and may then be planted close together where they may be sheltered with Glasses, and have the Benefit of the Sun; but we must note, that they should be secured before any Frost can pinch them, or they will rot.

The second Week in this Month, sow *Carrots*, *Turnips* and *Onions* to stand the *Winter*.

Earth

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Earth up *Sellery* in Drills, and plant out a new Parcel to succeed the former.

Plant out *Collyflowers* to blossom in *September*.

Plant *Cabbages* and *Savoys* for *Autumn*, and *Winter Use*.

Guard against Wasps and other Insects, which now devour your Fruit, by placing Phials of Honey and Ale near Fruit-Trees; this Way you may soon catch a large Quantity of them. Once every Week renew the Bottles, and above all, take Care to bruise the Insects you take out of them; for though they are seemingly dead, I have known a warm Day or two bring them to themselves; therefore take Care how you throw them heedlessly away.

There is no Time more proper to war against *Ants*, and other destructive Vermin, than this Month; they are now all abroad, and may be taken. [See Mr. *Laurence's* Invention for destroying of *Ants* and *Earth-worms*, in his *Fruit-Garden Kalendar*, P. 74.]

Be careful to pick off all crumpled Leaves, wherever you see them, and the very Twigs themselves, if they are curled, for they are the Beds of destructive Creatures.

I the more particularly recommend the Destruction of these devouring Vermin, because of their wonderful Increase, especially the smaller Kinds of them, such as infect the *Collyflower*, whose Eggs are five hundred Times less than the least visible Grain of Sand, and many thousands of them in Number, lay'd (as I believe) from one single Insect, so that from a second Generation of them, they are so numerous, that if every Egg which one might find upon a blighted *Collyflower*, was a Globe of an Inch Diameter, they would fill more Space than the whole Terrestrial Globe. The wonderful Smallness of the Eggs of those

those Creatures, I confess, may seem very strange to those who are unacquainted with the Use of Microscopes; but this is no more curious than what the late famous Dr. *Hook* has taught us in his Works, where he mentions the Seeds of Moss, which were so small, that *Ninety Thousand* of them being laid together in a strait Line, did not exceed the Length of a Barley-Corn, and that 1,382,400,000 of them would weigh only a Grain. But see more of these Minute-Beings in Dr. *Hook's Micrographia*, Mr. *Lowenboeck's* Works in the *Philosophical Transactions*, and the Chapter of *Blights*, in my *New Improvements*, Part III.

Hough and weed, as in the former Month.

About the twentieth, sow some *Collyflowers* to stand the *Winter*; for the right Season for this Work is chiefly to be regarded, if we propose to have good Flowers early in the *Spring*; for sowing them only a few Days sooner or later, makes them either run before their Time, or come much later and weaker than they ought to do. If the *Winter* be mild, and the *Plants* are set close together, many will run up to Seed; and if sharp Frosts, and a rough Season begins in *November*, some of this Sowing (with the usual Helps) will make good forward *Plants*: However, since the Price of a little Seed can be no great Matter to a curious Man, I advise to sow again the first Week in the next Month, as I shall more particularly direct; so that from these two Seminaries it will be impossible to miss of a Crop to our Mind; for if the first run, they will not be quite unfit for Use, and those sown in *August* will then certainly produce good Flowers in the *Spring*.

We sow *Chervil* for *Winter*.

We

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We take up this Month *Shallots*, *Garlick*, and gather *Rocamboe* when the Stalk turns Yellow.

When the Stalks of *Onions* change their Colour, pull them up in dry Weather, and expose them to the Sun, 'till they are well dry'd, to lay up for the *Winter*; but take care the Rain does not come at them after they are out of the Ground.

Transplant *Endive*, for blanching against *Winter*.

Cbadrones should now be tied up with Hay or Straw-Bands for blanching.

Make a Bed for *Mushrooms*, and be sure to cover it very thin with Earth, hardly two Inches thick; for on that depends your Success.

Weed your young Nurseries of *Forest-Trees*.

Products of the Kitchen-Garden in JULY.

WE have *Ronceval-Pease*, *Garden-Beans*, and *Kidney-Beans*; and some commend the *Wing'd-Pease* to be gather'd very young, and dress'd as *Kidney-Beans*.

We have *Collyflowers*, *Cabbages*, and *Artichokes*, in Abundance, and some of the small *Artichoke-Suckers*, to be eaten raw or fried.

All Sorts of Herbs for the Kitchen are very good, if the Gardener has minded, from Time to Time, to cut them down for shooting afresh: Aromatick Herbs, especially, are in their greatest Perfection.

Sallads for this Month are composed of *Cabbage-Lettuce*, *Purflane*, *Tarragon*, *Burnet*, young *Onions*, *Cucumbers*, Flowers of the *Nasturtium Indicum*, and some *Endive* blanch'd.

We have young *Carrots*, *Turnips*, and *Beets*.

We have great Plenty of *Musk-Melons*, *Currants*, *Gooseberries*, *Rasberries*, *Cherries*, *Plumbs*, *Apricots*, *Peaches*, and *Nectarines*, and the *July* and *Sweet-Water Grapes*, at Mr. *Whitmill's* at *Hoxton*.

The *Juniting*, and *Codling* are now good, and some *Pears*. We yet have some *Wood-Strawberries*; and towards the End, our first *Figs* are ripe, and some of the *July Grapes*.

This is the best Month for pickling *Cucumbers*.



Works to be done in the Kitchen-Garden in
AUGUST.

THE first Part of this Month the Weather is commonly hot and dry, so that watering is still necessary; but about the latter End, we are not without Danger of frosty Nights, and I have observed, that then also our first Rains begin.

We may water in the Evenings, 'till the fifteenth; and after that, if there is Occasion, the Morning is to be preferr'd for that Work, for fear of Frost.

The first Week sow a second Crop of *Collyflowers* to stand the *Winter*, lest the first should run to Seed, which they will be apt to do, if we have an open Season 'till *Christmas*, or the Ground be light, and be in a Bottom; especially near the Sea, 'tis good to provide against such Accidents.

Sow *Radishes*, *Cabbages*, *Coleworts*, and *Onions* to stand the *Winter*.

Sow

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Sow *Lettuce*, *Chervil*, *Corn-sallet*, and *Spinach* for *Winter Use*.

Now break off the Stems of such *Artichokes* as have done blowing.

Sow *Cresses* to stand the *Winter*; they will heighten the Taste of those *Sallads* which are gathered upon the Hot-Beds in *December*, *January*, &c.

Transplant *Cabbage-Lettuces* to stand the *Winter*, especially of the *Dutch Brown Sort*.

Tye up *Endive* for blanching.

Give more Earth to your blanching *Sellery*, and continue to raise the Earth about it every Fortnight, 'till it is fit for Use.

Gather Seeds as directed in the former Month.

Yet continue to destroy Weeds, and such Vermin as annoy your Trees.

Towards the End, slip and set Aromatick Herbs, as *Savory*, *Thyme*, *Hyssop*, &c. and cut down those which are run to Seed within three or four Inches of the Ground.

'Till the tenth of this Month, we may sow *Turnips* in the open Field, especially about *London*, for these Roots not only yield a profitable Crop, but very much enrich all light Soils. In those Parts near the Sea in *Devonshire*, the twentieth of this Month will not be too late to sow them; for that Country is so fortunately situated, that it will perfect a *Plant* above fifteen Days sooner than any Part about *London*; and from the best Observations I can make, I find that about *Northampton* all Plants come near a Fortnight later than in our *London* Gardens; so that *Turnips* should be sown in those Parts very early in *August*, or rather the End of *July*.

*Products of the Kitchen-Garden in
AUGUST.*

FOR boiling, we have *Cabbages*, and the *Sprouts* of the first *Cabbages*, *Collyflowers*, *Artichokes*, *Cabbage-Lettuce*, *Beets*, *Carrots*, *Potatoes*, and *Turnips*; but other boiling *Roots* should not yet be touched.

We have yet some *Beans*, *Pease*, and *Kidney-Beans*.

All Sorts of *Kitchen-Herbs* are now as in the last Month.

We have *Radishes* and *Horses-Radishes*.

The *Sallads* are *Cabbage-Lettuce*, *Cucumbers*, with a Mixture of young *Cresses*, *Mustard*, *Radish*, and a little *Tarragon*.

Roots now dry in the House are *Onions*, *Garlick*, *Shallots*, *Rocambole*.

We have Plenty of *Cucumbers* for pickling, and this Work should not be now any longer delaying, for the first Frost or great Rains spoil them.

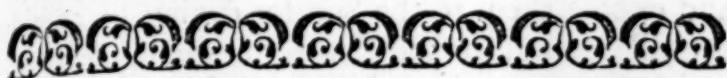
We have *Musk-Melons* in Abundance.

Towards the End, we begin to cut some *Sellery*.

We have still some *Gooseberries*, *Rasberries*, and *Currants*, with some of the *Carnation* and *Morella Cherries*, *Apricots*, *Plumbs* of various Kinds, several Sorts of *Peaches* and *Nectarines*, *Pears* and *Apples*, several Kinds of *Figs*, *Mulberries*, and *Filberts*.

And of *Grapes* the *July*, Mr. *Whitmill's Sweet-water*, and his small *Blue Raisin*, which is the *Morignon*, an excellent *Grape* for a *Vineyard*, and the *Burgundy Grape*.

Works



Works to be done in the Kitchen-Garden in
SEPTEMBER.



IN this Month the Gardener has great Variety of Business, and must employ his Head as well as his Hands, towards furnishing his *Kitchen-Garden* with every Thing necessary for *Winter* Use. The Showers, which are seldom wanting at this Season, prepare the Ground for the Reception of many Plants and Seeds; and the great Heats also declining, give us now Opportunity of replanting many Things, which would have been endanger'd by removing in the preceding Months.

At the Beginning, hough *Turnips*, the first Time.

If the Weather be dry, gather such Fruits as are now ripe upon the Trees, and such others as are full grown, and in good Condition to be laid up in the House for the Use of the two following Months.

Note, Such *Pears* or *Apples*, as are fit to gather, will easily leave the Tree; therefore use no Violence to pull them off, for such as do not willingly part from the Tree, will shrivel, and have an insipid Taste.

Gather such small Seeds as are now ripe, according to the former Directions.

Gather your *Leek* Seed, if the Seeds are black, cutting the Heads from the Stems, and spread them upon a Sheet every Day in the Sun, 'till they are fit to be thrash'd out.

Gather the Pods of *Garden* and *Kidney-Beans*, and expose them to the Sun for drying, to be laid up 'till Spring, or the Time you would use them, and let them not be taken out of the Seed-Pods, 'till your Grounds is ready for them, for the Pods preserve the Seed. In the like Manner save your choice Sorts of *Pease*.

The *Cucumbers* which are now full ripe must be cut open, and the Seeds and Pulp taken out of them, to remain together two or three Days before they are wash'd clean: The Seed may then be kept in Water about twenty-four Hours, and laid to dry in the Sun for ten Days. Be sure all Seeds are thoroughly dry before they are laid up, or they will rot.

Cover now every Night your *Cucumbers* sown in *July*.

Sow some of the *Spanish Radish* for the *Winter*. Make Beds for *Mushrooms* as before directed.

We may yet replant *Endive*, and all Sorts of Fibrous-rooted Herbs.

Continue to earth up *Sellery*, and now raise Banks of Earth about your *Chardones* for blanching.

Sow *Spinach* to be cut in *February*.

Yet sow *Sorrel*, and *Chervil*.

Make Plantations of *Cabbages* and *Coleworts*.

'Tis now a good Season to transplant *Strawberries*.

Now make Plantations of the *Dutch Brown Lettuce*, to stand the *Winter*.

Transplant young *Collyflower Plants* in Places where they are to flower, and in Nurseries under some warm Wall or Place of Shelter. Note, Those which are now planted out for Good, will blossom above fifteen Days sooner than those which are planted in the *Spring*, and will produce much larger

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ger Flowers, if they are well defended from Frosts with Glafs Bells.

If the Season be dry, water in the Morning.

The last Week, if Showers fall, is a very safe Time to plant Fruit-Trees, although their Leaves are not fallen; such as *Peaches*, *Nectarines*, *Cherries*, and other *Stone-Fruit*; but *Apples*, *Pears*, &c. may be delay'd 'till the Middle of the next Month.

We may now transplant *Asparagus Roots*.

Sow small Herbs for *Sallads* in some well exposed Place, observing to provide such Mixtures for this Season, as are hotter to the Taste, than what are raised in the former Months; for the Evenings (the best Time to eat *Sallads*) are now cold.

Sow some Seeds of the *Nasturtium Indicum* in Pots to stand the *Winter*, which they will do very well, if they are shelter'd in a common Green-house.

Products of the Kitchen Garden in **SEPTEMBER.**

WE have now several Kinds of *Peaches*, *Grapes*, *Figs*, *Pears*, and *Apples*, with some of the late Kinds of *Plumbs*.

We have yet *Melons* and *Cucumbers*.

Walnuts are now good, and *Filberts* full ripe.

This Month affords us some young *Garden-Beans*, and *Ronceval-Pease*, and we have yet some *Kidney-Beans*.

Upon the *Artichokes* which were planted at *Spring*, we have now very good Flowers and Suckers, and we have still Plenty of *Collyflowers*.

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We have *Cabbage-Lettuces* of several Sorts in great Perfection, and *Radishes*.

Sallads for this Month are composed of *Cresses*, *Radish*, *Chervil*, young *Onions*, *Tarragon*, *Burnet*, and *Lettuce*, with some blanch'd *Sellery* and *Endive*.

We have Plenty of *Mushrooms* upon Beds and in Pasture-Grounds.

We have *Carrots*, some *Turnips*, *Skirrets*, *Scorzonera*, and *Beets*, both the *Red* and the *White*.

Roots for the Kitchen Use, are *Horse-Radish*, *Onions*, *Garlick*, *Shallots*, and *Rocambole*.

We have Abundance of *Cabbages*, and *Sprouts of Cabbages*, with some *Savoys*; but the last eat much better when the Frost has pinch'd them.



Works to be done in the Kitchen-Garden in
OCTOBER,



E ought now to make Use of every Opportunity to compleat our Plantations of Herbs for *Winter* Use. The greatest Part of this Month we may expect tolerable Weather; but after that, our chief Business will be to secure from the Severities of the Season, all Plants which are in Danger of being injured by the Frosts and high Winds.

'Tis the first Week in this Month, that I advise the sowing of *Cucumbers* on the natural Ground, to be afterwards transplanted into Pots, where they may be shelter'd from the Cold of the Nights,
till

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till a gentle *Hot-Bed* is necessary for them. This Way of raising *Cucumbers*, to have them come forward, is certainly much better than to begin after the usual Method in *December* or *January*; for these *Plants* will better endure the cold Air than those which are raised when the Ground is cover'd with Snow.

Now set some *Kidney-Beans* in Baskets under some warm Wall, to be afterwards assisted by moderate *Hot-Beds* as the Season becomes violent: With good Management these will fruit very early.

Take up those *Collyflower* Plants which begin to flower, tie their Leaves together, and bury their Roots and Stalks in Sand in a Cellar, or some cool Place; the Flowers will increase in Bigness, and remain good two or three Months.

Also cut *Artichokes* with long Stalks, and preserve them in the House, setting their Stalks in Sand.

'Tis now the Season to lay up Roots for *Winter* Store, such as *Carrots*, and *Parsnips*; and some Gardeners also think it best to take the Roots of *Turnips* out of the Ground, and lay them in Sand: But I rather chuse to leave the *Turnips* in the Ground, till we are ready to use them; and for the other two Kinds, I prescribe the following Method: Make choice of a dry Part in your Garden, and there dig a Trench about six or eight Inches deep, into which (without Mixture of Earth or Sand) lay your Roots close together, first cutting off their green Tops and growing Buds, and then cover them about six Inches thick with Wheat-Straw, ridge-wise. We may this Way preserve them fit for Use, till the following *June*.

'Tis

'Tis now the best Time of the Year for transplanting of Fruit-Trees, although their Leaves are upon them.

Transplant *Forest-Frees* of all Sorts, from the Beginning to the End of the Month; the *Elm* especially about the first Week, although its Leaves are then very green. I have seen the Experience of this at *Mamhead* in *Devonshire*, the Seat of *Thomas Balle*, Esq; a very curious and learned Gentleman.

About the Middle of the Month sow the *Cyder-Pressings* in Beds of fresh Earth, to raise Stocks for grafting, or even making of *Orchards* without grafting. From a Nursery of this Kind we raise as many different Sorts of *Apples* as we raise *Plants*, although the Seeds came all from the same Tree; so much is Nature pleas'd with Variety: And it may be, was the Earth more constant and uniform in its Productions, its Vegetative Power would be too soon exhausted, for I conceive, were all *Apples* exactly the same, they would all draw the very same Nourishment from the Earth; and the like with every other Tribe of Vegetables. But this Variety seems to determine what I have often thought of, that there are as many distinct Qualities in the Earth, as there are different Kinds of *Plants* growing upon it, and that each *Plant* can only take out of the Earth that Spirit which its Parts are naturally prepared to receive, and leave the others undisturbed. If the Generation of *Plants* is allowed, as I have endeavoured to explain it in the First Part of my *New Improvements*, the vast Varieties in *Plants*, seem to proceed from the coupling of one *Plant* with another; that is, the *Farina Fecundans* of one Sort, being conveyed by the Air, and lodg'd upon the Female Parts in the Blossoms of another Tree, changes the Properties

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ties in the Seed, which it impregnates, so as to make it produce a Tree, differing, in some Respects, from the *Mother-Plant*.

Now lay up some *Acorns* and the *Mast* of other Timber-Trees in dry Sand.

We may yet transplant *Cabbage* and *Collyflower* Plants; and now make your last Plantation of *Lettuces* to stand the *Winter*.

The *Cucumbers* which I directed to be sown in July, must now be carefully covered up every Night, and the Glasses be kept over them in wet or windy Weather; but give them Air in the Day-time, if the Season will permit.

Continue to Earth up *Sellery* for blanching.

Towards the End, earth up and dress such *Artichokes* as have done blowing.

Sow *Cresses*, *Lettuce*, *Mustard*, *Radish*, *Turnip*, and *Spinach* upon a decay'd *Hot-Bed*, to be cut for *Sallads*.

If you have not yet made a Plantation of *Lettuces* (already cabbaged) for *Winter* Use, delay no longer to do it in some well-exposed Place, where they may be defended from the Frost.

Now gather such *Pears* and *Apples* as are full ripe, in a dry Day, without bruising them, and lay them in the Fruiterie upon dry *Moss*.

Sow *Radishes* in some warm Place to draw early in the *Spring*.

Sow some of the *Hotspur-Pease* and *Spanish Beans* in some well exposed Border, rather under a thick Hedge, than under a Wall.

Make Plantations of *Gooseberries*, *Currants*, and *Rasberries* from the *Suckers* or Cuttings.

Now make Plantations of *Apples* (grafted upon *Paradise Stocks*) in Pots; they will bear when the Trees are very small, and are very Ornamental

at

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at an Entertainment, to be set growing upon a
Table.

Now put some Roots of *Mint* upon a gentle
Hot-Bed.

Products of the Kitchen-Garden in
OCTOBER.

IN this Month we have yet remaining some
Collyflowers, Artichokes, Pease and Beans.

The *Kidney-Beans* sown in *July*, will now produce good Fruit, if we defend them from the cold Nights.

We have yet *Cucumbers*, and some *Melons*.

Roots for boiling are, *Turnips, Carrots, Parsnips, Potatoes, Skirrets, Scorzonera, and Beets.*

Roots to use raw in the Kitchen are, *Onions, Garlick, Shallots, Rocambole.*

Sallad Herbs are, *Cresses, Chervil, Mustard, Radish, Turnip, or Rape, Spinach, Lettuce*, both small, and several Sorts of *Cabbage-Lettuce, Burnet, Tarragon*, and young *Onions*, with blanch'd *Sellery* and *Endive*.

We have *Chardones*.

Herbs for Soup and other Kitchen Uses, are *Parsley, Beets*, and all the Aromatick Herbs.

Ripe Fruits in this Month, are some of the late *Peaches and Plumbs, Grapes, Figs*, and *Mulberries*, with some *Filberts and Walnuts*, and great Variety of *Pears and Apples*.

We have Plenty of *Mushrooms*.



Works to be done in the Kitchen-Garden in
NOVEMBER.

 HIS Month is subject to violent Winds, frosty Nights, and great Rains, taking their Course by Turns to the great Hurt of our Gardens and Plantations. It is not enough to guard against the pinching Frosts, or shelter many tender Plants from the cold Rains which fall at this Season, but we must also be diligent to secure our Fruit-Trees and such Forest-Trees as have been lately planted, with strong Stakes, lest they are blown down or shaken by the boistrous Winds now coming from the West ; for nothing, in my Opinion, contributes to destroy the Welfare of a young Tree more, than to leave it unguarded and expos'd to the Mercy of the Winds ; the young Fibres lately form'd, are broken, and every Part through which the Sap should have its Passage to the Head, is bruised and wounded ; so that for want of a free Passage for the Sap, the Top is not half supply'd, and the whole languishes.

Now trench Ground, and lay it up in Ridges to mellow.

Set *Beans* of the *Spanish* Kind, and some of the *Hotspur-Pease*, in some well-exposed Place.

Prepare now a gentle *Hot-Bed* for the *Cucumbers* sown in *October*, and for the *Kidney-Beans* sown at the same Time ; but plant them not together ; for the Warmth which is necessary to keep a *Cucumber*, would destroy the *Beans*.

Now

Now make *Hot-Beds* for *Asparagus*, to have some in *December*; and if we are not provided with *Roots* in our own *Nursery*, we may take them from some old *Plantation* which is worn out. Set the *Roots* close together, without trimming, taking Care that they do not come within two Inches of the *Dung*, and that their *Buds* are covered at least four Inches thick with *Earth*. [See further Directions in my *New Improvements*, Part III.]

'Tis now a very good Time to lay down *Branches* of the *Vine*, especially such as we would have *Fruit* upon the following Year, to be set growing in *Pots* upon a *Table* at great *Entertainments*. The *Branches* for this Purpose must be *Shoots* of the same Year, and so drawn thro' the *Hole* at the *Bottom* of a *Garden Pot*, that when it is filled with *Earth*, there may be a reasonable Number of *Eyes* or *Buds* above *Ground*: A strong *Branch*, perhaps, may bear eight or nine *Bunches* of *Grapes*, and as the *Branch* is smaller, in proportion, four or five.

Now prune your *Vines* growing in the open *Borders* and *Vineyard*, and plant new ones where there is *Occasion*: They will bear plentifully, and their *Fruit* will ripen very well without the *Help* of a *Wall*, if we make *Choice* of the *Black Currant Grape*, the *White Muscadine*, *Burgundy*, the *July*, and *Mr. Fairchild's Sweet-water*; especially when they are rightly manag'd, as in the *Garden* of *Mr. Rigaud*, near *Swallow-Street*, who never fails of a good *Crop* of *Fruit* from *Vines* planted in open *Borders*.

Continue still to plant *Trees*, if the *Weather* be open, and plant *Suckers*, and *Cuttings* of *Gooseberries*, *Currants*, and *Vines*.

Plant *Mint* upon moderate *Hot-Beds*.

Sow

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Sow *Lettuce, Cresses, Mustard, Radish, Turnip* and *Spinach*, upon *Hot-Beds* for young *Sal-lads*.

Earth up *Sellery*, and tie up *Endive* Plants for blanching.

Now is the best Time to cut off the *Asparagus* Haulm; when it is turn'd yellow, cut it within two or three Inches of the Ground, and fling up some Earth out of the Alleys upon the Beds; or if your *Asparagus* has been worn, give it a Covering of rich Soil.

Continue still to trench Ground, and in frosty Weather wheel Dung and other Manures upon such Places as want to be enrich'd, for then the Walks will not be spoiled.

Sow *Pease* and *Beans* of the *Hotspur* or *Spanish* Kinds in open Ground; and if the Weather be fair, Earth up those sown in *September*.

Products of the Kitchen-Garden in
NOVEMBER.

THIS Month we have *Collyflowers* in the Green-House, and some *Artichokes*.

Roots to be used this Month are *Carrots, Parsnips, Turnips, Beets, Skirrets, Scorzonera, Horse-Radish, Potatoes, Onions, Garlick, Shallots, Rocabole*.

Pot-Herbs are *Sellery, Parsly, Sorrel, Thyme, Savory, Beet-Leaves, and Clary*, out of the Garden: And of dry'd Herbs, we have *Mint, Sweet Marjoram*, and Flowers of the *Marygold*.

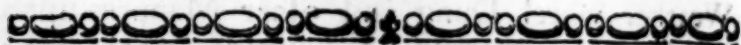
Herbs for boiled Sallads are *Cabbages*, and the *Sprouts of Cabbages*, some few *Savoy Cabbages*, and *Spinach*.

We

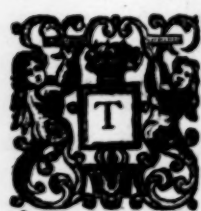
We have *Cucumbers* upon those Plants sown in *July*, if we have kept them well guarded from Rain and Frost.

Sallads for this Month, are the small Herbs on the *Hot-Bed*, with *Burnet*, *Cabbage-Lettuce*, *Sellery*, and *Endive* blanch'd, and young *Onions*.

We have yet some *Grapes*, *Peaches* and *Figs*, with *Apples* and *Pears* of several Sorts; some *Bullace*, *Walnuts*, *Hazlenuts*, *Chestnuts*, *Medlars*, and *Servises*, with some *Arbutus* or *Tree-Strawberries*.



Works to be done in the Kitchen-Garden in
D E C E M B E R.



THIS Month, commonly called the *Black Month*, is subject to every Sort of Weather which is fatal to Plants of a tender Nature. All Vegetables of our Climate seem now to sleep, the Days are short, and every little Warmth from the Sun makes every curious Lover of Gardens wish for the Spring; tho' indeed 'tis now an ingenious Gardener will shew his Skill, in helping Nature by Artifice, to produce such Fruits and Herbs as she is not capable of bringing forth without very extraordinary Assistance.

Guard against the Violence of Frosts, which commonly begin with great Severity to reign in this Month.

In bad Weather, and chiefly in the long Evenings, a Gardener ought to employ himself in his Study, in preparing and fitting up his Garden-Tools, and making such Shelters for tender Plants

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Plants as will now be requir'd. He ought to provide his Shreds for nailing, and look over his Fruiterie, removing all such Fruits as are any ways damaged, for they spoil the rest.

Examine Orchard Fruit-Trees, and take away such Branches as make Confusion, covering every considerable Wound with some of the following Mixture :

Take of *Bees-Wax*, *Rosin* and *Tar*, equal Quantities, to which add of *Tallow* about half the Quantity of any one of the former ; melt and mix them together in an Earthen-Vessel well glazed, and immediately after any Amputation, dip a painting Brush in this Mixture, and cover the Wound with it ; this will keep the wet and cold Air from penetrating into the Body of the Plant, and keep it from rotting.

Set Traps for Vermin ; they now destroy your Roots and Seeds.

In open Weather we may sow *Pease* and *Beans*, of the same Kinds, and in the same Manner, as directed in the former Month.

We must now look carefully after our Hot-beds, and add to their Heat, if they begin to cool, by lining them with hot Dung ; but we must always remember the Design of these Beds is rather to defend the Plants in them from Cold, than to make them grow quick. If we were careful to raise Plants of *Cucumbers* and *Kidney-Beans*, as I directed in *October*, we shall now see them in a hopeful State, and much more capable of resisting the Frosts than those that were sown at the Beginning of this Month, as many Gardeners are used to do.

Towards the Middle of the Month make a Hot-bed for *Asparagus*, to be order'd in the same Manner as that made in *November*.

Sow upon a Hot-bed, *Lettuce*, *Radish*, *Cresses*, *Mustard*, and other Herbs which are hot, to cut for small Sallads.

In frosty Weather bring into the Garden the necessary Manures for enriching the Ground.

*Products of the Kitchen-Garden in
D E C E M B E R.*

WE have now many Sorts of *Cabbages* and their Sprouts for boiling, and *Spinach*.

In the Conservatory we have some *Collyflowers* and *Artichocks* preserved in Sand.

The Roots for this Month are the same as in the last.

Sallads are the small Herbs upon the Hot-bed, with *Mint*, *Tarragon*, *Burnet*, *Cabbage-Lettuces* preserved under Glasses, with some *Cresses* and *Chervil* upon the natural Ground, which have a high Taste, and help the Sallads of this Season very much; and with these we have *Sellery* and *Endive* blanched.

Herbs for Soups and the Kitchen Use, are *Sage*, *Thyme*, *Savory*, *Beet-Leaves*, the *Tops* of young *Pease*, *Parsly*, *Sorrel*, *Spinach*, *Chervil*, *Sellery* and *Leeks*, with *Sweet Marjoram* and *Marygold-Flowers* dry'd, and also dry'd *Mint*; for the *Green Mint* at this Time of the Year is scarce, and not so good for Sauces as for Sallads.

We have *Asparagus* upon Hot-beds; and, if we have been diligent, we have yet some *Cucumbers* upon the Plants sown in *July* and *August*.

We have Plenty of *Pears* and *Apples*.

Monthly



Monthly DIRECTIONS

For ordering the

Green-House and Flower-Gardens.

JANUARY.



IF the Weather be very severe in this Month, fling some loose Straw over your Beds of *Anemonies* and *Ranunculus*; or if such Beds of Flowers are already covered with Snow, let it remain till it begins to thaw, and then we cannot be too expeditious in removing it; for the Snow-Water has a very ill Effect upon Bulbs and Roots of this Kind, if we suffer it to sink into the Ground about them; and besides, if a frosty Night should speedily follow a Thaw, the Wet near the Surface would freeze into a thin Ice, which would cut or wound the Leaves or Stems of these Flowers, and make them decline.

G g 2

If

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If the Weather is gentle and open, plant *Anemomy* and *Ranunculus* Roots in Beds of Earth well wrought with a Spade; and indeed if it were sifted, it would be much better. *Note*, The Earth cannot well be too light for these Flowers, and especially the *Ranunculus*: It should be fresh, and free from any Mixture of Dung, which breeds Vermin, and is ever destructive to Roots of this Kind.

About the Middle, pick off the dead and wither'd Leaves from your *Auriculas*, and take away as much Earth out of each Pot as possible, without disturbing the Roots, to make Room for some fresh Earth, prepared with sandy Loam mix'd with one third Part of rotten Wood.

Note, That in filling up the Pots with this Earth (which must be well sifted) press it gently about the Roots, and raise it quite to the Leaves, but bury none of them, for they will decay.

Note also, All compos'd Earths should lye at least a Year before they are used.

Guard well against the Mice, for this Month they destroy all bulbous Roots they can come at, particularly the *Crocus*.

In the Green-House, pick off all mouldy and wither'd Leaves from the Plants; for whatever they touch they infect. Give no Water to any Plant that will hold up its Head without it; and in severe Weather, rather endeavour to keep the Cold out of the House, than make the Plants grow by any forcing Heat; for Shoots made at this Time of the Year are sickly, and weaken the Plant. Upon a Thaw, make a small Charcoal Fire or two, in Proportion to the Bigness of the House, and let in a little Air at the same Time, if the Wind is not too cold: These Fires dry the Damps which arise always after a Thaw,
and

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and by destroying those poisonous Vapours, keep the Plants dry, and free them from the Danger of rotting.

Transplant the *Winter Aconite* in Flower, and part its Roots; for when the Leaves of this Plant are decay'd, 'tis very hard to find the Roots.

Flowers blowing in the Green-House and Flower-Garden in JANUARY.

Several of the *Ficoides* are now in Flower, and *Aloes* of several Sorts begin to put forth their Flower-Stems. The *Indian Yellow* and the *White Spanish Jessamines* have yet some Blossoms upon them, and some sickly *Orange-Trees* blossom about this Time. The Plant known to the Gardeners by the Name of the *Candy Tuft Tree*, or *Tblapsi Sempervivens*, is yet in Flower, and some Kinds of the *Geranium*.

In the Flower-Garden we have in Blossom the *Winter Aconite*, *Single Wall-Flowers*, the *Christmas Flower*, or *Black Hellebore*, and that Sort with a green Flower; *Snow-Drops*, double and single, the *Brunal Hyacinth*, some *Stock-July-flowers*, where they are well shelter'd, *Single Anemones*, the *Gentianella*, the *Winter Cyclamen*, *Primroses*, and some Kinds of the *Polyanthos*, the *Laurus-Tinus*, *Mezerions White and Red*, and the *Arbutus* or *Strawberry-Tree*. The *Holly* and *Pyracantha* are now adorned with their beautiful Scarlet Fruit, and likewise the *Amomum Plinii*.

We have now also the *Glastenbury Thorn* putting forth a few faint Flowers, if the Frosts do not hinder; and as this Plant usually begins its blossoming in *December*, it has given Room for some superstitious Persons to look upon it as a

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Miracle, thinking the Flowers appear only upon *Christmas-Day*, as the Story goes of it. *Joseph* of *Arimathea*, they say, coming into *England*, brought with him a Staff of this Thorn-wood, and set it, upon a *Christmas-Day*, in the Ground at *Glastenbury*, where it immediately took Root, budded, and blossom'd; and so it has continued to do ever since upon that Festival, as the People tell us, in Honour of St. *Joseph* its Master: But the Plant being now pretty well known, and cultivated in several Places, we find it very apt to mistake a Week or two in the Time of its blossoming, according as the Winter has been more mild or severe: sometimes I have seen it in Flower the Beginning of *December*, and at other Times it has not budded 'till the Middle of *January*; however, it seldom fails of Flowers about that Season, and has nothing more in it than what we find in all other Plants brought from foreign Parts, which at the Time of their natural Spring are ever disposed to blossom, notwithstanding the Opposition of our Seasons; and it is not unreasonable to think, this Plant was originally brought from some Country where the Spring is about *December*, such as *Arabia*, the *Holy-Land*, and many other Places about the same Latitude: And if it was true that the first Plant of it at *Glastenbury* grew from a plain Staff or Twig without Root or Branch, it is no Wonder, although it had been taken from the Tree six Months before; for I have frequently cultivated Plants in as bad a Condition, which have been longer than six Months without Earth, and they have grown very well; some Stakes of the *Willow*, for Example, will do the same. This Plant may be increased by grafting it upon the *White-Thorn* in *March*.

Such

Such as are minded to make Gardens of Flowers for the several Months in the Year, may compose them from these Catalogues of Flowers blowing in the several Seasons, only observing, that such as are to be in their Perfection in the Winter, should have as much of the Sun's Benefit as possible.



Works to be done in the Green-House and Flower-Garden in FEBRUARY.



Continue the Works of the former Month, if the Season has not then been favourable enough to finish what was directed to be done.

The first Week sow *Auricula* Seeds in Cases filled with light Earth, such as rotten Wood or Leaves, but chiefly (if we can get it) the Earth taken out of the hollow Places in *Willow-Trees*. When the Earth is raked level, sow the Seeds upon it, and then press all down with a Piece of smooth Board; cover these Boxes with Nets, and let them stand in some shady Place giving them frequent Waterings 'till they come up. [See my *New Improvements*, Part II.]

Now likewise sow the Seeds of *Polyanthos* very shallow upon some shady Border.

Mix *Anemomy* Seeds with dry Sand, and sow them in very light Earth, allowing them a thin Covering of Mould well sifted.

We may still put into the Ground, in some shady Place, Roots of the *Anemomy* and *Ranunculus*, to blow late.

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About the Middle of the Month give fresh Earth to your *Carnations* that were planted out in *Autumn*; those Flowers will blow much stronger than such as are planted out for blowing in *March*.

Turn and skreen Mould for the Use of the next Month.

If the Weather be open, transplant all Sorts of flowering Shrubs, which bear the Weather, viz. *Syringa*, *Lylac*, *Guilder Rose*, *Laburnum*, *Roses*, *Jessamine*, *Honeysuckles*, *Spireas*, *Altheas*, &c.

Part and transplant *Pæonies*.

Towards the End, sow *Larkspurs*, *Holly-oaks*, *Canterbury-Bells*, *Primrose-Tree*, *Sweet-Williams*, *Annual Stocks*, *Candy-Tufts*, *Pinks*, and the *Scarlet Lichness*, especially if the Soil be light; but in stiff Soil we may delay that Work 'till about the tenth of *March*.

'Tis now a right Season to shift such *Myrtles* as want large Pots; at the same Time shaving off the outside Fibres of their Roots, and, if they have Occasion, prune their Heads pretty close.

Also about the End of this Month, head *Orange-Trees*, and give them fresh Earth, always minding to wax those Wounds we have made with soft Wax. [See my *New Improvements*, Part III.]

Stir the Surface of the Earth in your Pots in the Conservatory, but be not over hasty in giving Air to your tender Plants, for they will not yet bear it. 'Tis now the Time that many Exoticks perish through the Indiscretion of some Gardeners, who are tempted to open the Windows of the Green-House, when the Sun shines a little favourable upon the Plants.

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We may now make Layers of *Roses*, *Jessamines*, *Honey-suckles*, *Phillarea*, *Laurus-Tinus*, and other such like Shrubs.

Sow the Seeds of the *Laburnum*, *Spanish-Broom*, and the *Berries* of *Bays*, *Yew* and *Holly*.

Sow exotick Seeds from the hottest Climates upon Hot-beds, especially the annual Kinds, which require several Months, and great Heat to bring them to Perfection.

Now cut down the *Spanish Jessamine* within four Inches of the Stem, at the same Time giving them fresh Earth.

Make Layers of the *Yellow*, *Indian*, and *Portugal White Jessamines*, *Pomgranates*, *Olives*, and *Arbutus*, minding to interr only the most tender Branches; for those which are once become woody will never take Root.

Sow *Orange* and *Lemon* Kernels in Pots as soon as they are taken out of the Fruit, and set the Pots in Hot-beds.

Now make Plantations of the *Lilly of the Valley* on the Side of some shady Bank.

Flowers now blowing in the Green-House and Flower-Garden.

WE have several Kinds of *Hellebore* yet flowering, the *Winter Aconites*, *Snow-drops*, chiefly that with double Flowers, *Crocus*, both the *Yellow* and the *Purple* Kinds, some *Hyacinths*, *Single Anemonies*, *Persian Iris*, *Single Hepaticas*, *Single Dafodils*, *Single Wall-Flowers*, some *Double Daisies*, *Stock July-flowers*, and the *Spring Cyclamen*; and in the *Green-House*, the *Tblapsi Sempervivens*, some *Ficoides*, *Geraniums*, *Aloes*, and the *Yellow Indian Jessamine*.

Some

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Some *Oranges* also put out a few Blossoms, if they are not in good Health.

In the forcing Frames at Mr. *Millet's*, a famous Nursery-Man at *North-End* near *Fullham*, we have now *Roses*, and *Double-Junquils* in Flower.

The *Mezerions* and *Laurus-Tinus* yet remain in Blossom.



*Works to be done in the Green-House and
Flower-Garden in MARCH.*



OW is the best Season to sow *Poppies*, *Venus Looking-Glass*, and such other fine Annuals as we durst not venture in the common Earth in the preceding Month. We may now also part or slip all Kinds of fibrous-rooted Plants that are not flowering, as *Gentianella*, *Double White Rockets*, *Scarlet Lichness*, *Cardinal Flower*, *Rose Champions*, *Double Wall-Flowers*, *Holly-oaks*, *Perennial Sun-Flowers*, *Asters* of all Sorts, *Monk-Hood*, *Sweet-Williams*, *Sea-Pinks*, &c.

Sow the Seeds of the *Stock-July-flowers*.

Now slip and set *Box* for *Edgings*, or in *Figured Works*; but take up no more in one Day than you can plant.

Defend your *Tulips* from *Blights*, which endanger them this Month. Make a Frame of Hoops over your choicest Bed, and cover it with Mats in bad Weather. Some have Coverings of Canvas to take off and on at Pleasure, which they make use of as well to shade their Flowers in the Time of their Bloom, as to help them against the injurious Frosts and Blasts.

Now

Now mend and repair your Shelves and Places of Shelter for blowing your *Auriculas*, for at the End of this Month they should be set in Order. This Place should face the *East*, and be defended on every other Side from the Sun: The Top should have a Covering of Bast-Mats, or Canvas, to keep the *Auriculas* from Wet; for the least Rain imaginable spoils the Beauty of these Flowers.

About the Beginning of the Month, transplant your *Carnation* Layers for blowing, if they were not planted out in *Autumn*, which is much the best Time for that Work. Let the Earth for these Flowers be two Thirds of sandy Loam, well incorporated with one Third of rich *Melon* Earth, or rotten Wood: This Mixture ought to be, at least, two Years old, before it is used.

Sow now upon the Hot-bed such exotick Seeds as are less tender, and come sooner to Perfection than those sown the last Month; such as the *Nasturtium Indicum*, *French* and *African Marygolds*, *Balsamines*, *Convolvulus*, especially the little *Blue*, the *China*, or *Indian Pink*, and such others as would have been too rampant for the Hot-bed, if they had been sown the last Month: for 'till the Middle of *May*, we must not venture any of these abroad in the natural Ground; and therefore if they were to be sown early, they would touch the Glasses long before we could give them Liberty enough.

If we have not the Conveniency of Hot-beds, we may defer the sowing of the *African* and *French Marygold*, the *Nasturtium* and *Marvel of Peru*, 'till the next Month, and then they will come up in the natural Ground, if they are sown under some warm Wall.

Delay

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Delay no longer to sow the Seeds of the *Humble* and *Sensitive Plants* upon the Hot-bed; they are wonderful Curiosities, but must always be kept under Glasses.

Now sow, in the natural Ground, the wild *Spirting Cucumber*, and the *Noli me tangere*; they are diverting Plants, when their Fruit is full ripe.

Give fresh Earth to your Pots of the *Campanula Pyramidalis*, and set them into some Pit where the Sun may come at them; this Method will make them grow tall, which is the chief Excellency of this *Plant*.

Now likewise sow their Seeds, and take off Slips from the Roots.

Plant *Tuberoses* in Pots of fresh Earth, giving them a gentle Heat, and no Water, 'till they sprout.

Transplant now the *Arbor Judæ*, and sow the Seeds of it.

Graff the *Spanish White Jessamine* upon the common *White English* Sort.

Plant and make Layers of the *Passion-Tree* in moist Places, to make it bear Fruit.

Put such exotick *Plants* into a Hot-bed as have suffered in the Conservatory; but take special Care they are well guarded from the Steam of the Dung, by a due Thickness of Earth laid upon it.

Now transplant the *Amomum Plinii*, or *Winter Cherry*; prune their Roots, and shorten their Branches, give them fresh Earth, and set them in the Front of the Green-House, for they are hardy, and will now bear the Air. *Note*, They are great Lovers of Water, and if they have Shade enough when they are set abroad, they will bear Fruit plentifully.

Take

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Take especial Care now of your *Orange* and *Lemon-Trees*, that they don't want Water, give them little at a Time, and often; use them by Degrees to the Air, and we may preserve their young Fruit, which is very apt to fall at this Season of the Year, if they are over-water'd, or are too hastily made acquainted with the Air.

Towards the End, we may transplant *Yews*, *Hollies*, *Phillarea*, and other *Ever-greens*, and sow the Seeds of the *Evergreen Privet*.

Mind to water your Cases of *Auricula* Seeds.

In a warm Day, begin to give a little Water to the most succulent *Ficoides*.

Flowers now blowing in the Green-House and Flower-Garden.

WE have now *Anemonies* both double and single, *Hyacinths*, *Junquils*, several Kinds of *Narcissus*, and chiefly the *Narcissus of Constantinople*, some of the *Precope Tulips*, and of the later Kinds of *Crocus*, particularly the *White Polyanthos* of all Sorts, *Violets*, *Daisies*, *Wall-Flowers*, *Stock July-flower*, *Iris* of several Kinds, *Hepaticas*, of the double Sorts, *Crown Imperial*, *Dens Caninus*, *Grape Hyacinths*, and some Sorts of *Fritillaria*, a Flower now highly in Request in *Holland*, for its vast Variety (as I am inform'd); and towards the End, we have some few *Auriculas*.

The Trees in Blossom are the *Almond*, *Apricot*, *Peach*, *Arbor Judæ*, *Laurus-Tinus*, some *Oranges*, and we have still some Flowers of the *Indian Yellow Jessamine*, with some Sorts of *Ficoides*, or *Fig-Marygolds*, and *Aloes*.

Works



Works to be done in the Green-House and Flower-Garden in APRIL.

 E may begin this Month with sowing in the natural Ground, the less tender exotick Seeds, and such Flower-Seeds, as we have omitted to sow in the preceding Month. Many Seeds from the *Cape of Good Hope*, and from *Virginia*, will come up, being sown at this Time of the Year in natural Borders well exposed.

We may now sow *Scarlet Beans*, *Scabicus*, *Columbines*, *Marygolds*, *Gnaphalium*, and *Cyanus*.

We may now sow *Pine* and *Fir Seeds*, covering them with a Net to keep them from the Birds, who are very voracious of them; even after they are come up.

We may yet part and set all Fibrous-rooted *Plants*.

Now is the best Time of the *Spring*, to remove all Sorts of *Evergreens*, putting large *Hollies* in Baskets for their greater Safety in Transportation; for *Hollies*, at best, have but few Roots, and can hardly hold their Earth without this Help. Plant their Baskets with them; but *Yews* will do well enough without this Charge; if they have been dug about in the Nursery, their Roots will be full of little Fibres, and will hold the Earth together.

Make fresh Hot-beds to forward your young Seedling *Oranges* and *Lemons*, and other exotick *Plants* now come up, and fit to transplant from the first Hot-bed.

Pot

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Pot some of your *Amaranthus Tricolor* and *Cocks-combs*; give them a fresh Bed to draw them tall.

About the Beginning, your *Auricula* Seed will begin to appear above Ground, if it has been carefully water'd, and before let it not want at this Time, for the young *Plants* will soon wither. Keep those Cases in the Shade, 'till *August*, that we plant them out.

Begin now to water your *Aloes*, *Sedums*, *Torch-Thistles*, *Euphorbiums*, and other tender succulent *Plants*; but give it in very small Quantities when the Sun shines hot, and now begin to use those tender *Plants* to the Air, by little and little.

The Windows of the *Orangery* may now be open from Morning 'till Night, if the Winds are not very violent.

Stick up your *Carnations*.

After Rain, clip your Edgings of Bog, roll your Grass and Gravel-Walks; also rake over, and renew, if there is Occasion, your Walks of Cockle Shells, and Works in Sand, cut the Edges of your Grass, and mow it often, for now it grows apace.

Stake up all *Plants* and *Flowers* which are now grown to any Height, for the Winds are now dangerous.

Destroy Weeds before their Seeds are ripe.

The *Auriculas*, which are now in their full Bloom, should once in three Days be refreshed with moderate Waterings; the Flowers will be the better coloured for it, and the Seed come to greater Perfection; but keep the Sun and Rain from them.

*Flowers now blowing in the Green-House
and Flower-Garden.*

THIS Month furnishes us with great Variety of *Ranunculus* and *Double Anemonies*, and, towards the End, we have some *Tulips*.

Daisies also still continue flowering, as do also the *Double Hépaticas*, and *Polyanthos* of divers Kinds. We have several Kinds of *Narcissus* and *Double Junquils* now in their Prime. The *Crown Imperial* is not yet past flowering, and we have now several Sorts of *Iris* and *Fritillaries*, with some *Hyacinths*. We have also several Kinds of *Cyclamen*, some *Stock July-flowers*, and *Single Pæonies* towards the End; some *Double Violets* yet remain: But above all, we are now rewarded with the *Auricula*, which is in its Prime about the 20th. The Trees and Shrubs now blowing, are the *Lylac*, *Persian Jessamine*, *Laburnam*, *Double* and *Single-blossom'd Almonds*, the *Arbor Judæ*, some *Pears*, *Cherries* and *Apricots*; and in the *Green-House*, some *Oranges*, *Ficoides*, *Aloes*, and some Kinds of *Geranium*.

*Works to be done in the Green-House and
Flower-Garden in MAY.*

UT down the Leaves and Flower-Stems of *Crocus*, and other bulbous-rooted Flowers that have done blowing, unless you design any of them to stand for Seed; and indeed I would advise

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advise every curious Person to save some of the best every Year, to have Nurseries of Seedlings of every Flower; for from such Seminaries we may expect numberless Varieties.

Gather now your *Anemony* Seed as it ripens, for it is quickly carried away by the most gentle Air.

About the Tenth is the best Time to sow *Carnation* Seeds; for if they were to be put sooner into the Ground, they would grow woody before *Winter*, and many of them canker and go off. Let the Earth be fresh sandy Loam, well sifted.

Our choice *Tulips* are now in Flower, and must be shaded from the Mid-day Sun, and defended from the Rain, if we are minded to have them last a long Time in Flower; when they have done blowing, break off the Seed-Pods, that the Roots may gather Strength.

If any one has a Mind to dry some of his choicest *Tulip-Leaves*, he must provide Books of brown Paper, and lay the Leaves of the Flowers singly between the Leaves of the Book; when they have been in this State for a Day, press'd down by a very gentle Weight, they must be shifted into a fresh Book, and removed in like Manner from one Book to another every twenty-four Hours, adding more Weight as they grow dryer: In fine, when all the Moisture is out of them, we may then stick them upon thick white Paper, with a little *Gum-Arabick* and fair Water, and they will hold their Colour for many Months.

I the rather mention this Way of drying Plants and Flowers at this Time, because every Lover of *Botany* is not perhaps rightly skilled in preserving Specimens of *Plants*, and also because this Month affords us greater Variety of *Plants*

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for

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for that Purpose, than any other Month in the
whole Year.

Be now careful to tie up the Spindles of your
Carnations, lest they are broken by the Winds or
other Accidents.

Repeat the Sowing of many annual Flowers,
such as the small *Annual Stock*, *Venus Looking-
Glass*, and *Candy-Tufts*, giving them frequent
Waterings (if the Weather be dry) 'till they
come up.

About the fifteenth, if the Weather be gentle
and settled, which is (as some say) when the
Mulberry-Leaves are as large as a *Crow's Foot*,
bring your *Orange* and *Lemon Trees* out of the
Conservatory. What I here mention of the *Mul-
berry's* indicating to us the proper Time for bring-
ing Abroad our tender *Plants*, has, in my Opi-
nion, Reason enough in it, (though some will
not allow it as a sure Rule to go by) for the
Mulberry-Tree, which is a foreign *Plant*, and has
a thicker Juice than any other Tree that I know
of, requires (as we find) a settled Warmth and
equal Temperature of Air to put its Juices into
Motion; and as that Motion cannot in a few
Days shew itself in the Production of the Leaves,
and would stop upon the least Appearance of
Frost, so of Consequence, when we see the Leaves
of this Tree arrived at the Largeness of a *Crow's
Foot*, we may be assured the Weather has been,
for some Time, in a gentle State, and therefore
our *Orange-Trees* may then come Abroad with
Safety; for we have had no Instance of Weather
that has been capable of injuring the *Orange-
Tree* after enjoying a serene Week in this Month.
It is a Thing worthy our Remark, how many
different Degrees of Heat or Cold are necessary
to the Vegetation of several Kinds of *Plants*.
The Temper of Air in *January*, pushes forth
the

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the Buds of the *Elder-Tree*; the greater Warmth in *February* puts the *Gooseberry-Bush* and some Sorts of the *Quickset* in Motion; in *March* we see the Blossoms of the *Almond* and *Peach-Tree*; in *April*, the *Elm*, and some others, begin to open their Leaves, and the *Mulberry* will not stir 'till the Weather of this Month is settled; and every Plant may perhaps require a distinct Degree of Heat and Cold, call it what you will, to make it vegetate. This is not unlike what we observe in Melting or Liquifying of metallick and other Bodies. Ice will melt with less Heat than Tallow, Tallow with less Heat than Wax, Wax with less Heat than Rosin, Rosin than Lead or Tin, and these will melt with less Heat than other Metals.

Upon bringing out your *Orange-Trees* and other Exoticks, clean their Leaves from the Dust they have got in the House, unless a gentle Shower saves you that Trouble; give them all fresh Earth on the Surface of their Pots or Cases, and water them well when they are placed in the Order they should stand. Let not the Sun shine too hot upon your *Orange-Trees*, for that will make their Leaves turn yellow.

Now make Cuttings of *Ficoides* and *Sedums*, letting such of them as are very succulent lye a Day or two in the Sun, after they are cut from the Plants to dry the wounded Parts, and then plant them in an open Border to be potted, after they have struck Root, which will be in less than two Months.

Plant Cuttings of the *Arabian Jessamine*; they easily take Root.

Plant Cuttings of *Geraniums*, and other such like exotick Shrubs, in some open Border; they will take Root better there than in Pots.

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About the Tenth of this Month, inarch *Orange* and *Lemon-Trees*, rather upon *Lemon* than *Orange* Stocks, they will make stronger Shoots: By this Means we may have bearing *Plants* as small as we please, in a very short Time, for they may be cut from the *Mother-Plants* the Middle of *August*.

Also now inarch the *Spanish White Jessamine*, and the *Indian Yellow Jessamine*, upon strong Stocks of the common *White Jessamine*, and be not fearful that these will not take upon the Stocks, because our common *Jessamine* drops its Leaves, and the others do not: I have experienced the Truth of it, as well as the inoculating the *Laurel* upon the *Black-Cherry* Stock, which grows very freely.

Such as are minded to build *Green-Houses* for the Use of the next *Winter*, should not any longer delay that Work, lest the Walls be not thoroughly dry when the *Plants* should be set in; and I cannot help taking Notice also, how much the Intent of such a Building ought to be regarded by the Architect; for hitherto I have not seen one *Green-House* in *England*, which had the Beauty of a good Building, and good Convenience for the keeping of *Plants* at the same Time, which is one Reason why Gentlemen have been discouraged from the Culture of exotick *Plants*.

Towards the End of this Month, or the Beginning of the next, cut some Leaves of the *Opuntia* or *Indian Fig*, letting them lye two or three Days to dry, before they are set in the Ground. The Earth for them should be sifted Rubbish of old Brick Walls one third, to be mingled with light rich Earth, well sifted. Set these Leaves about an Inch in this Earth, and let them remain
Abroad

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Abroad fifteen Days before you put them in a Hot-Bed.

When the Weather is settled, transplant from the Hot-Bed to the open Borders all your choice Annuals, as *Capficums*, *African* and *French Marygolds*, *Amaranthus*, *Basils*, *Convolvulus*, &c.

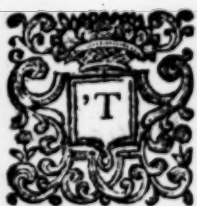
Plant Cuttings of *Pyracantha* of the tender Shoots, and Cuttings of the *Passion-Tree*, in moist Places,

Flowers now blowing in the Green-House and Flower-Garden.

OUR choicest *Tulips* are now in Flower, as also some *Stock July-flowers*, *Double Wall-flowers*, *Monkshood*, *Single Scarlet Lichnefs*, *Double Pinks*, *Sweet-Williams*, *Double Yellow Globe-flowers*, *Sea Pinks*, *Candy Tufts*, *Venus Looking-Glass*, *Annual Stock*, *Periwinkle*, *Double Daisies*, and *Feather-few*, *Foxgloves*, *Muleins*, *Bulbous Iris*, some *Anemonies* and *Ranunculus* that were put late in the Ground, *Double White Rocket*, *Honeysuckles*, *Pyracantha*, *Syringa*, *Roses*, *Apple Blossoms*, *Spireas*, *Spanish Broom*, *Guilder Roses*, *Laburnum*, *Canterbury Bells*, *Cytissus*, *Columbines*, *Larkspurs*, *Gla-diolus*, *Poppies*, *Pæonies*, *Fraxinella*, *Spider-wort*, *Cyanus*, *Antirrhinum*, *Valerian*, *Martagons*, *Lillies*, *Orchis*, *Iris*, *Marygolds*, some *Lupines*, *Oranges*, *Ficoides*, *Aloes*, *Sedums*, *Geraniums*; and in the Water-Tubs, the *Yellow Nymphaea* or *Water-Lilly*, *Pond-Weeds*, *Water-Ranunculus*, the *Flamula* or *Spearwort*, and *Frogbits*.



*Works to be done in the Green-House and
Flower-Garden in JUNE.*



IS now a good Time to take up such bulbous Roots as have done blowing: Wash them clean as soon as you have taken them out of the Ground, and spread them upon Mats in the Sun, that they may be well dry'd before they are laid up in the House.

'Tis now the best Season to transplant the Roots of *Cyclamen*, *Saffron*, and *Colchicum*.

Now visit the Rivers, Bogs, Pools, Ponds, and Ditches, for choice aquatick Plants. We may transplant them, although they are Flowering, into our Water-Tubs, which make a very pretty Show among exotick and other curious Plants. When you collect these Plants of the Waters, observe the Depth of Water they grow in, and allow them the same, if possible, when you plant them in the Tubs.

Lay such of your *Carnations* as are strong enough, and carefully pick off their weak and most tender Flower-Buds, for they rob the larger Pods of their Nourishment. The large podded *Carnations*, which commonly burst, must now be help'd, especially after Nature of herself has split one Side of the Flower-Pod; open the other Side of the Pod opposite to it with a fine Penknife, but touch not the Petals or Flower-Leaves; this Method will make the Flower open equally without scattering, which it certainly will do, if we were to split down every Division of the Pod.

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Pod. Also destroy Earwigs with *Oxboofs* and *Tobacco-Pipes*; for the Way of guarding your *Carnations* from these destructive Insects with *Basons* and *Troughs* of Water, is of little Signification, because they have Wings, though not easily discovered.

Gather *Auricula* and *Polyanthos* Seed, and preserve it in the Seed-Pods till you sow it.

Bring abroad your *Aloes*, *Torch-Thistles*, *Euphorbiums*, and tender *Tithimials*, and clean them from the Dust they have contracted in the House: Also pull off with Care the decay'd Leaves of your *Aloes*, and transplant them, if there is Occasion, into bigger Pots.

We may now take off Cuttings of the *Euphorbium* and *Torch-Thistle*, letting them lye in the Sun till the Wounds are healed, before we put them into the Ground; let the Earth for them be the same as I directed for the *Indian Fig*.

Now take off the Off-sets and Suckers growing about the Roots and Stems of your *Aloes*; plant them in the same Earth mention'd above, and let them remain abroad fifteen Days before they are set into a Hot-Bed. Give these succulent Plants little Water till they have taken Root.

Water *Oranges* (which are now in Flower) frequently, a little at a Time, that the Fruit may set; and pick off the Blossoms where they are too thick. Now you can hardly give your *Myrtles* too much Water; remember they naturally grow in Marshy Ground.

Continue to transplant Annuals after Rain, and sow others to succeed those sown in the former Months.

Flowers now blowing in the Green-House and Flower-Garden.

WE have now blowing *African* and *French* *Marygolds*, *Convolvulus*, *Female Balsams*, *Amaranthus*, *Larkspurs*, *Candy-Tufts*, *Venus Looking-Glass*, *Annual Stocks*, *Stock July-flowers*, *Double Scarlet Lychness*, *Rose Campions*, *Sweet-Williams*, *Campanulas*, *Fox-gloves*, *Muleins*, *Moth-Muleins*, *Sea Pinks*, *Double Pinks*, *Virgins Bower*, *Periwinkle*, *Cyanus*, *Lillies*, *Martagons*, *Monkshood*, *Sun-flowers*, *Holly-hocks*, *Nasturtium Indicum*, *Gentian*, *Virginian Spiderwort*, *Scarlet Beans*, *Sweet Sultan*, *Poppies*, *Pomegranates*, *Olives*, *Oranges*, *Lemons*, *Geraniums*, *Ficcoides*, *Sedums*, *Fritillaria Crassa*, *Roses*, *Honeysuckles*, *Jessamine*, *Oleander*, *Spanish Broom*, *Hellebore*, *Indian Fig*, some *Carnations*, *Double flowered Featherfew*, *Valerian*, *Sea Ragwort*, *Orchis*, *Antirrhinum*, *Lupines*, and *China Pinks*. In the *Water Tubs* we have the *Double White Nymphaea* or *Water-Lilly*, the *Single Yellow*, the *Water-Violet*, and *Water-Milfoil* in Flower.

*Works to be done in the Green-House and Flower-Garden in JULY.*

WE may yet continue to lay *Carnations* as they gather Strength, and often refresh them with *Water*, shading the *Blossoms* from the violent Heat of the *Sun*,

Continue

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Continue to destroy Weeds, and cut down the Flower Stems of such curious Flowers as have done blowing, unless they are worth saving for Seed.

Now is the best Time to raise *Myrtles* of Cuttings, taking only the most tender Shoots; set them in the Shade, and give them frequent Waterings.

Transplant now such Bulbs as you took not out of the Ground the last Month.

We may sow *Tulip* Seeds, which are now ripe, in Cases of light Earth, that they may be carry'd under some Shelter in the Winter. Sow also some *Anemony* Seed as directed in *February*, and sprinkle it often with Water.

Clip for the second Time *Box Edgings*.

Continue to make Cuttings of *Torch-Thistles*, *Indian Figs*, *Fig-Marygolds*, *Tythimals*, *Sedums*, and other succulent Plants.

Give fresh Earth to the Surface of your *Orange* Tubs, which Work should be done at least four Times a Year.

About the 20th, inoculate *Orange* rather upon *Lemon* Stocks than any other.

This is the Time when the Berries of the *Coffee-Tree* ripen; they are then of a bright red Colour, and may be gather'd for sowing immediately, cleaning their Seeds from the Pulp: Set them singly about an Inch deep in Pots of fine Earth, and give them the Assistance of a Hot-bed, by which Means they will sprout in less than six Weeks Time, as I have seen at the Physick Garden at *Amsterdam*. This Plant being a great Rarity, see the Figure of it, *Plate I. Fig. II.*

The Fruit of the *Ananus* being ripe about this Time, cut off the Crown of Leaves which grows on the Top of it, and plant it in light sandy

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fandy Earth; it will presently strike Root with
the Assistance of a Hot-bed made of *Tanners
Bark*, for they will not bear the Steam of Horfe-
dung.

We may also now lay down young Shoots of the
Arabian Jessamine.

Tie up and prune all your Exotick Plants
which grow disorderly; they will be covered
with fresh Shoots before they are set into the
House.

Gather such Flower Seeds as are now ripe,
drying them well in their Seed-Vessels before
they are beaten out; and even after that, dry
them in the Sun for a Week or ten Days before
you lay them up, for else they will be subject
to rot.

Yet sow some *Annuals* in Edgings, to blow in
September; for then the Garden wants Flowers.

*Flowers now blowing in the Green-House and
Flower-Garden.*

THE *Carnation* is now the Glory of the
Flower-Garden, and the Seedlings of that
Flower offer something new every Day. The
other Flowers now blowing, are *Oranges*, *Lemons*,
Myrtles, *Coluteas*, *Oleanders*, *Geraniums*, *Passion-
flowers* of several Kinds, *Jessamine* of *Arabia*,
Brazil Jessamine, common *White Jessamine*, *Pome-
granates*, *Olives*, *Capers*, *Bean Caper*, *Ficoides*,
some *Aloes*, *Sedums*, *Dittany*, some *Roses*, *Amo-
mum Plinii*, *Convolvulus*, *Amarantbs*, *African*
and *French Marygold*, *Tulip-Tree*, *Golden Rod*,
Fritillaria Crassa, *Apocinum* several Sorts, *Aspho-
del*, *Tuberoses*, *Cardinal Flower*, *Double Scarlet*
Lychness, *Campanulus*, *Virgins Bower*, *Sweet*
Sultans, *Capsicum*, *Marvel of Peru*, *Female Bal-
sams*,

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sams, Eagle-flower, China Pinks, Sun-flowers, Holly-hocks, Foxgloves, Everlasting Flowers, Scarlet Beans, some Double Poppies, Gentian, Fraxinella, Nasturtium Indicum, Veronica, Nigilla, Chrysanthemum, Lupines, Stock July-flowers, Spiderwort, Indian Figs, Arbutus, and some of the late sown Annuals.



Works to be done in the Green-House and Flower-Garden in AUGUST.



THE beginning of this Month is a good Season for parting *Auriculas*, that they may gather sufficient Strength before Spring. Rather plant one single Head in each Pot than covet many, for where we leave more than one upon a Root, we must expect the Blossoms will be small.

'Tis now a proper Time to transplant your Seedling *Auriculas* above five Inches a-part, upon a Border of well-sifted Earth; give them a gentle Sprinkling of Water after planting, and shade them from the Sun with Mats for fifteen Days.

Now also transplant your seedling *Polyanthos* upon a shady Border, and divide the old Roots.

If we have any good Seeds of the bulbous *Iris*, *Fritillaries*, and *Ranunculus*, it is now a very proper Season to sow them, covering the Seeds with a thin Coat of fine-sifted Earth. *Note*, Seminaries of this kind will reward our Patience with great Variety of beautiful Flowers. *Note* also, The best *Ranunculus* Seed comes from France.

Shade

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Shade your *Anemony* and *Tulip* Seed, which was sown in the preceding Month.

Plant *Single Anemonies*, and we may now transplant *Hyacinths*, *Narcissus*, *Lillies*, *Martagons*, *Crocus*, and *Snowdrops*.

Cut down the wither'd Stalks of such Flowers as have done blowing, and we may now part their Roots for Increase.

Gather Seeds in a dry Day.

The Middle of the Month, or somewhat later, cut the inarch'd *Orange* Stocks from the bearing Trees; but be careful you do it gently, for fear of breaking the new grafted Branch from the Stock; leave the Clay upon them 'till the following Spring, and guard them from high Winds.

It is now a good Season to transplant *Myrtles* and *Orange* Trees, if that Work was not done in the Spring.

Use not your Cuttings of *Torch-Thistles*, *Aloes*, *Indian-Fig*, &c. too tenderly in the Hot-beds; give them Air that they may harden against the Winter.

Plant Slips of *Pinks* in a Nursery, to plant out the following Summer.

We may now make Layers of all Sorts of Shrubs and Trees which remain abroad all Winter, always minding to lay down the most tender Shoots.

Toward the End, take off and plant out such of your *Carnation* Layers, as are well rooted; set them now in the Places where they are to blow; the Flowers will be much stronger than if they were to be planted in the Spring. Also in this Month we may lay such *Carnations* as were not strong enough in the former Month; but these will not be fit to transplant till *March* next,

Transplant

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Transplant seedling *Carnations* at a Foot Distance.

If we find any old *Roots of Carnations* which are disposed to blow late, put them now in Pots of fresh Earth, to set into the Green-house in *October*; I have often by that Means had good Flowers the greatest Part of the Winter.

Now set into the House your *Aloes*, *Torch-Tbistles*, *Euphorbiums*, and other such tender succulent Plants.

Flowers now blowing in the Green-House and Flower-Gardens.

WE have yet some *Carnations*, with *Sun-flowers* and *Holly-hocks*, *Roses*, *Pomegranates*, *Arbutus*, *Jessamines*, the *Common White*, *Spanish White*, *Brasil White*, *Indian Yellow*, and *Arabian Jessamine*, both *Double* and *Single Oranges*, *Myrtles*, *Oleander*, *Apocinum*, *Ficoides* of many Kinds, some *Aloes*, *Passion-flowers* of various Sorts, some *Sedums*, *Geranium*, *Tree-Mallows*, *Colutea*, *Guernsey Lilly*, *Tuberoses*, *Cardinal-flower*, *Female Balsam*, *Marvel of Peru*, *Chrysanthemum*, *Everlasting-flowers*, *Colchiums* *Autumn Yellow Crocus*, *Cyclamens*, *African* and *French Marygolds*, *Convolvulus*, *Capsicum*, *Starworts*, *Amarantbs*, *Nigilla*, *Sweet-Sultan*, *Scabious*, *Nasturtium Indicum*, *Linaria*, *Stock July-flowers*, *Eringo*, *Virgins Bower*, and those *Annuals* sown late, *Annual Stock*, *Poppies*, *Larkspur*, *Cany-Tufts*, &c. Also we have *Double Violets*, some *Auriculas* and *Polyanthos*, which now feeling a Temper of Air equal to their natural blowing Season, (i. e. *April*) are led to bring forth their Flowers at this Time: Also the *Alibea-Frutex* flowers at this Time.

Works



*Works to be done in the Green-House and
Flower-Garden in SEPTEMBER.*



YOU have now several Kinds of Flowers rising to a considerable Height; therefore to prevent Hazards by the Winds, tie them carefully to Stakes; for if Plants are loose, a little Wind injures them.

If you have not in the preceding Month taken off your *Carnation* Layers, defer that Work no longer, but be sure to plant them in the Places where they are to blossom; you will find the Advantage by so doing.

Now sow *Poppies*, *Larkspurs*, *Annual Stock*, *Candy-Tufts*, and *Venus Looking-Glass*, to stand the Winter, and blossom early in the Spring.

The first Week in this Month we may yet continue to plant *Evergreens*, such as *Hollies*, *Yews*, &c. if they rise with good Roots; but *August* is much the better Season.

Yet transplant flowering Shrubs of all Sorts, and make Layers of them.

We may still continue to transplant all Flowers which are fibrous-rooted, and have done blowing. Also cut down the Flower Stems of those which are to remain growing, within three Inches of the Ground..

'Tis now a good Time to put into the Ground some *Anemony* and *Ranunculus* Roots, to blow early; let the Earth be a light natural Soil well sifted for the *Anemonies*, but the *Ranunculus* should have about half rotted Wood mixed with it.

About

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About the End, put in some *Tulips*, especially the Breeders, but give them not rich Ground; remembering always, 'tis Want of Nourishment is the Cause of Variegations in Plants; therefore my Advice is to plant all breeding *Tulips* in Rubbish of old Buildings one half, and the rest natural Soil; or else set them about your pyramid *Yews*, which have stood long enough to impoverish the Earth.

Now put into the Ground your *Junquil* Roots, and let them stand two or three Years in the same Place.

Sow *Stock July-flowers*, that you may have a Supply in the Spring, if the Winter destroys your old Stocks. They love a dry Soil, mix'd with Lime Rubbish.

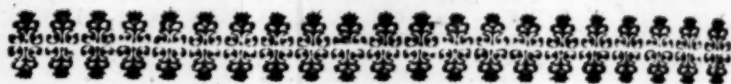
About the Middle of the Month, house your *Orange Trees*, *Geraniums*, *Ficoides*, *Sedums*, and others of the like tender Nature; but set them not in Order till *October*, that you may bring in your *Myrtles*, and such more hardy Plants. Let the Windows of the House remain open Night and Day.

We may yet sow the Seeds of bulbous-rooted Plants, as *Tulips*, *Anemonies*, *Ranunculus*, bulbous *Iris*, *Martagons*, *Crocus*, and *Fritillaries*, in Pots or Cases of fresh natural Earth well sifted.

Flowers now blowing in the Green-House and Flower-Garden.

WE have now in Flower the common *White Jessamine*, the *Spanish White*, the *Indian Yellow*, and the *Brasil Jessamines*, *Geraniums* of several Sorts, various Kinds of *Ficoides*, *Leonurus*, *Passion-flowers*, some *Aloes*, *Tblapfi*,
Semper-

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Semper-vivens, Amomum Plinii, Guernsey Lilly,
Golden Apples, Amaranths, Cyclamens, Colchicums,
Antirrhinum, Chrysanthemum, Sun-flowers, Holly-
hocks, Tuberoses, African and French Marygolds,
Double Violets, Marvel of Peru, Female Balsams,
Convolvulus, Nasturtium Indicum, Spiderwort,
Scarlet Beans, Saffron Crocus, Poppies, Larkspurs,
Annual Stock, Venus Looking Glass, Candy Tufts,
Stock July-flowers, some Carnations, Auriculas, Po-
lyanthos, China Pinks, Myrtles, Monthly Roses,
Asters of several Kinds, Pomegranates, Arbutus,
Oleanders, Colutea, Capsicum Indicum, and Althea-
Frutex.



*Works to be done in the Green-House and
 Flower-Garden in OCTOBER.*



ABOUT the Beginning of this Month
 house your *Myrtles, Amomum Plinii,*
Marum Syriacum, Meleanthus, and
 such tender Greens as remain yet a-
 broad ; at the same Time giving
 them, and all other House-Greens, a fresh Cover-
 ing of Earth, without disturbing their Roots: Tie
 up such as grow disorderly, and set them in their
 proper Places to stand the Winter, minding to set
 the most tender Plants, such as *Aloes, Torch-Thistles,*
Melon-Thistles, Euphorbium, &c. nearest the Sun,
 and the others which are more hardy, towards the
 Back of the House. After the Middle of the
 Month give no more Water to your tender succu-
 lent Plants, for they are subject to rot.

At the placing your Exoticks in the House,
 observe, that only one third Part of the Floor
 be

be taken up with the Shelves for the Plants, so that there may be as much Vacancy left between them and the Windows, and the same Space between them and the Back of the House; this Proportion being observed, the House will not be so subject to Damps as if it was crouded, and there will be Air enough contain'd in it to nourish the Plants, if it was to be closely shut up a Month together.

When you water your housed Plants, let it be in the Morning when the Sun shines upon them.

Keep open the Windows of the House Day and Night till about the fifteenth, and after that Time open them only in the Day-time.

Now make an End of putting in your *Tulips*, and plant also some *Anemonies* and *Ranunculus*.

Continue still to transplant and lay *Roses* and such like flowering Shrubs. Also plant the Cuttings of *Jessamine* and *Honeysuckle* in shady Borders, well wrought with a Spade; and be sure to bury at least two Joints of each Cutting in the Ground.

We may now sow the Berries of *Yew*, *Holly*, and such Evergreens as have been prepared in Earth or Sand.

Set your Pots of *Carnations*, which are now blowing, into the Green-House near the Door, where they may have the most Air. So also in the placing your Exotick Plants in the House, let the most tender stand the most remote from the Door, the more hardy will bear the Air, especially the *Ficoides*; but use none of them with too much Tendernefs, for more Plants have been kill'd with too much Care, than have been preserved.

Flowers now blowing in the Green-House and Flower-Garden.

WE have now flowering some Oranges, Myrtles, Geraniums, *Amomum Plinii*, Golden Apple, Aloes, *Ficoides*, or Fig Marygolds, *Leonurus*, *Apo-cinums*, Spanish Jessamine, Indian Yellow Jessamine, Brasil Jessamine, Common Jessamine, *Tblap-si Sempervivens*, Pomegranate, *Arbutus*, *Anemonies*, Single Polyanthos, Carnations, Stock July-flowers, Asters, *Antirrhinum*, Amaranths, Double Violets, Saffron-Crocus, *Colchicum*, Monthly Roses, several Sorts of Cyclamen, Passion-Trees of several Kinds, African and French Marygolds, Marvel of Peru, Capsicum, Single Wall-flowers, and some Bulbs from the Cape of Good-Hope, Heart's-Ease, or *Viola Tricolor*, and the *Laurus-Tinus*.

Works to be done in the Green-House and Flower-Garden in NOVEMBER.



IN this Month, if the Weather is not very severe, open the Windows of your Green-House a little, especially if the Sun shines, and at the same Time give Water to such Plants as require it. Let all the Water you use to the housed Plants be as simple as possible; for Mixtures of Dungs, or other hot Ingredients, spoil your Plants.

If Frosts should begin to set in, make a small Fire of Charcoal, and when it burns clear, hang it up near the Windows; but do this only at Night:

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Night: Or, indeed, if you had the Conveniency of one of those Chimnies improved by the Reverend and Learned Dr. *Desaguliers*, it might be set to work upon this Occasion; 'tis much the best Invention that I know of for warming a Green-House.

In this Month lay up Heaps of Earth for your several Sorts of Flowers, and make the proper Mixtures for the several Exoticks, as I have directed in the former Months. Where the Ground is too stiff, and we desire a natural Mixture, to bring it to the State of Loam, we must add to it a sufficient Quantity of Drift or Sea-Sand.

Now lay down your *Auricula* Pots upon their Side, the Plants towards the Sun; for much Wet rots their Leaves, and Frost is very injurious to them.

Shelter your young Seedling Bulbs from the Frost, but give them Air every Day, or they will go off.

If the Weather be open, we may yet transplant *Roses*, *Jessamine* and *Honeysuckle*, *Syringa* and *Lylac*.

Now cut down the Stalks of Flowers that have done blowing, within three Inches of the Root; I mean such as blow tall; for *Saffron*, *Cyclamen*, and *Colchicum*, must have their Herbage preserv'd till it naturally decays.

Unnail your *Passion-Trees* from the Wall, and lay them upon the Ground, that when severe Frosts come, we may cover them with Straw.

Tie up all Trees and Shrubs to Stakes; for the Wind of this Season breaks and destroys such as are loose and at liberty.

We may about the Beginning, plant *Hyacinths*, *Junquils*, and *Narcissus*, *Polyanthos* in Pots, and plunge them into Hot-beds, to blossom about *Christmas*.

*Flowers now blowing in the Green-House and
Flower-Garden.*

THE *Striped Lilly* is now so beautiful, that I cannot help taking Notice of it among the Flowers and Ornaments of this Month. We have now blowing, *Laurus-Tinus*, some *Myrtles*, *Spanish White Jessamine*, *Yellow Indian Jessamine*, *Candy-Tuft Tree*, *Geraniums*, *Ficoides*, some *Carnations*, in the House; *Aloes*, the *Amomum Plinii*, with its pretty scarlet Fruit, *Leonurus*, the *Golden Apples*, some *Passion-flowers*, *Single Anemonies*, *Gentianella*, some *Polyanthos*, *Stock July-flowers*, and *Double Violets*.

*Works to be done in the Green-House and
Flower-Garden in DECEMBER.*

AS no Plant can live without Air, a Gardener must now act with Judgment in helping his Green-House Plants; for the Air abroad is now so sharp, that were it to be let into the House immediately upon the Plants, it would pinch many of them to Death; and if the Plants were to be shut up for any considerable Time, without recruiting the Air in the House, they would be suffocated; it is therefore adviseable to provide some Means to recruit the Air in the House, from Time to Time, as there is Occasion, with fresh Air, corrected in such a Manner, that it may feed the Plants without pinching their Rind or

Bark,

Bark, as the Air abroad at this Season would do, if it was suffer'd to blow immediately upon them without Correction. Therefore, at the End of every Green-House there ought to be an Antichamber, thro' which we should pass in the Winter, and not by the common Door or Windows in the Front: The Chamber which I now speak of, is recruited with fresh Air from abroad every Time we go into it; and upon the opening the Door of that Room into the Green-House, the Air there mixing with the other which has been pent up, impregnates it with new Parts, which contribute to the Vegetation or Growth of Plants. Now to explain what I mean by these Parts in the fresh Air, which are necessary to the Growth of Plants, I must have Recourse to some Experiments which have been made upon Air, with respect to the Nourishment of Animals, who are in many Things analogous to Plants: For Example, a Man who goes into a Diving-Tub, where he is closely shut up from Air, except only what the Tub contains, will, after a little Space, find the Air grow hotter and hotter, 'till at length he is in Danger of being suffocated, and can have no Relief but by the Admission of fresh Air: This shews us, that in Air there is some particular Quality which is necessary to preserve Life in human Bodies, and when that Quality is exhausted, the remaining Air becomes useless: So every one who knows but little of the Nature of Plants, has certainly taken Notice, that a Plant, which has for some Time been debarr'd from Air, turns sickly, loses its Verdure, and often languishes beyond Cure. But again, we have another Experiment tending to confirm the former, further explaining what that Quality is in the Air which is necessary to maintain human Life, which seems to be the same which is necessary to main-

486 *Monthly Directions for ordering* [Dec.
tain Fire or Flame: A lighted Candle, for Example, being set under a Bell, closely fix'd upon a Table will burn perhaps a Minute or two, in proportion to the Quantity of Air pent up with the Candle in the Bell; but as soon as the Quality in that Air, which is necessary to feed the Flame, is exhausted, the Candle goes out: This has been try'd too often to admit of any Dispute that the Candle goes out by Chance; and we find that by letting into the Bell some fresh Air, a little before the Candle should have gone out, it will still continue burning; and then to shew that this Quality in the Air is the same which feeds the Life in Human Bodies, it was try'd, whether the Air returning from the Lungs, would not have the same Effect upon the Candle, as the external Air had before, but it had not; the Candle went out at its usual Time. Thus, it seems, when we suck in Air for Breath, the Lungs take what is necessary for the Nourishment of our Bodies, and return back the rest. But I believe I have said enough to explain what I design'd, in prescribing the letting in of fresh Air, at every Opportunity, into the Green-House, and shall now proceed.

Give little Water to your Green-House Plants, and be sure to remember this Rule, that *Aloes*, *Euphorbiums*, *Indian Figs*, *Melon-Thistles*, *Torch-Thistles*, and *Sedums*, have none at all 'till March is almost out.

Provide Shelters for your tender Flowers, such as choice *Anemonies* and *Ranunculus*, for now the great Frosts begin.

Be not over-hasty in warming your Green-House with artificial Heats, but let in as much Sun as possible; rather study to keep the Frost from your Plants, than make them grow; for untimely Shoots spoil Plants.

Pick

Dec.] *a Green-House and Flower-Garden.* 487

Pick off dead and rotten Leaves from your *Ex-tick Plants*, for they soon infect the whole.

Flowers now blowing in the Green-House and Flower-Gardens.

THE Leaves of the *Striped Lilly*, are now very beautiful, equal to any Flower. We have now in Flower the *Laurus-Tinus*, the *Glaberbury Thorn*, *Geraniums*, *Candy-Tuft Tree*, or *Tolapsi Sempervivens*, *Yellow Indian Jessamine*, *Spanish White Jessamine*, *Cyclamen*, *Ficoides*, *Aloes*, *Single Anemonies*, *Stock July-flowers*, *Single Wall-flowers*, *Antirrhinum*, *Common Primroses*, *Polyanthos*; and in Fruit, the *Arbutus*, or *Strawberry-Tree*, *Amomum Plinii*, *Golden Apples*, *Oranges*, *Lemons*, *Citrons*, *Pyracantha*, and in our Hot-beds we have some *Hyacinths* and *Narcissus*. We have now also in Flower the *Black Hellebore*, some *Snow-drops*, and the *Winter Aconite*,



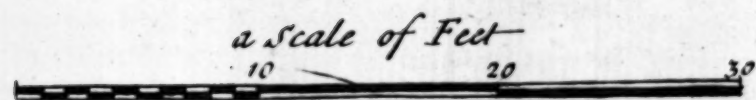
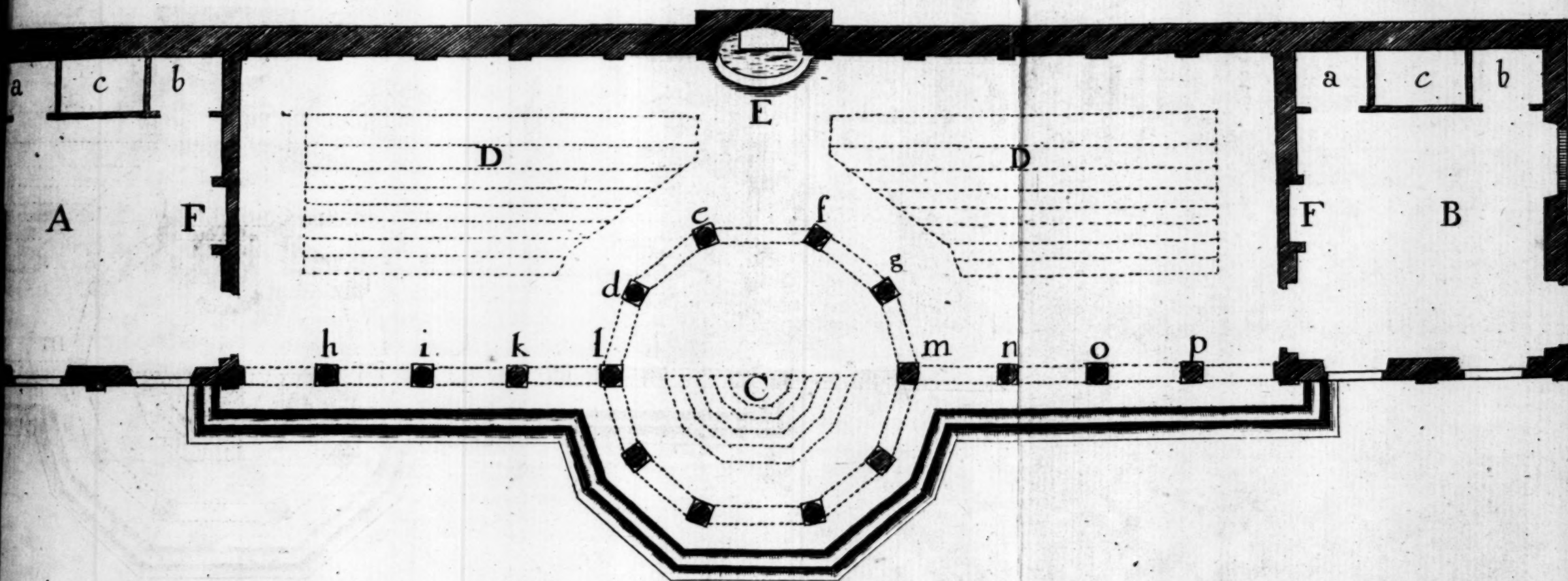


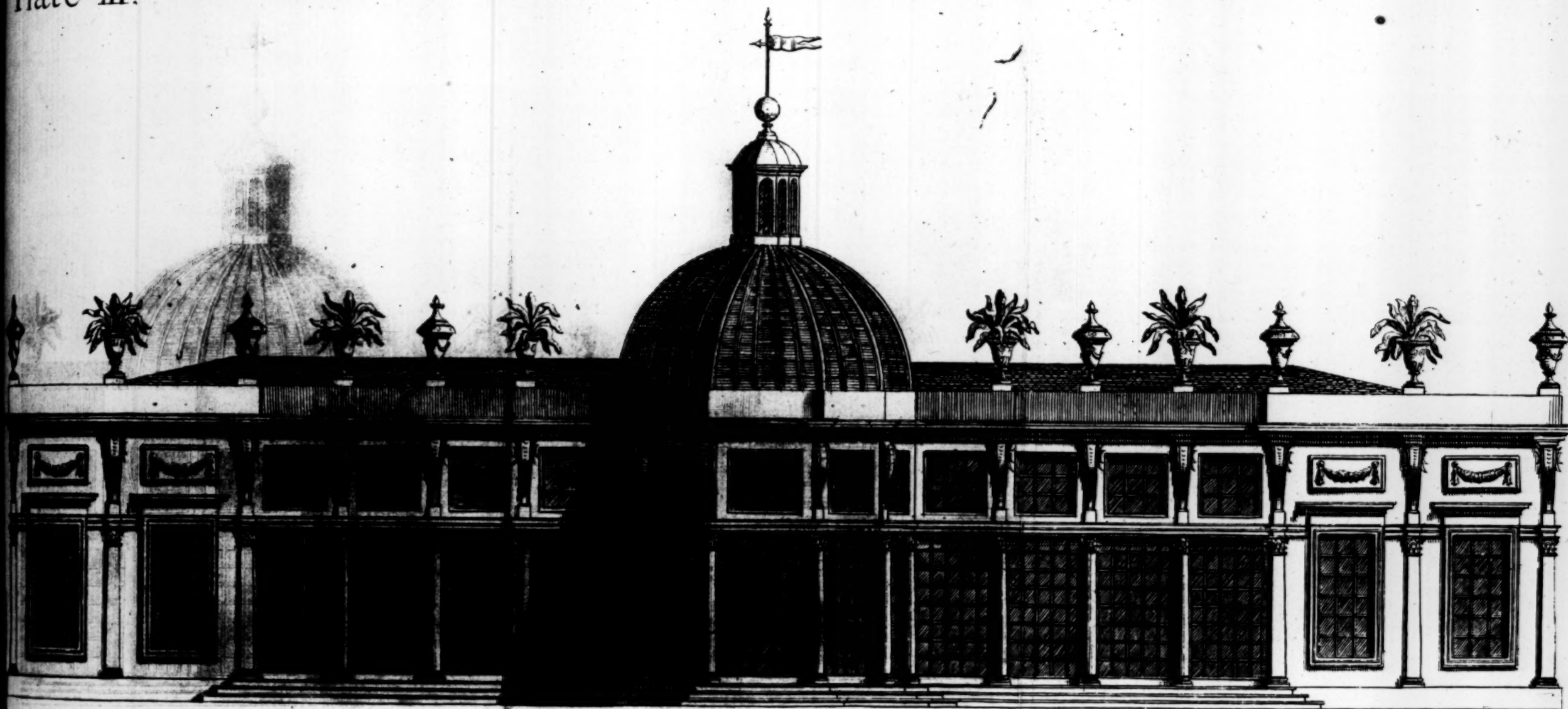
A
DESCRIPTION
OF A
GREEN-HOUSE,
CONTRIVED

For the good keeping of EXOTICK PLANTS
in the Winter; the Designs by Seignior
GALILEI of *Florence*,



S I conceive the little Regard for
Exotick Plants is chiefly owing to
the Difficulties which Gentlemen
have met with in preserving them
in the *Winter*, so I have endea-
voured to lay down such Rules for
their Management, as may render the Manner
of their Culture, easy and familiar to every
Lover of those Rarities; and when I consider
how much the Beauty and Advantage of the
Orangery is owing to the good Condition of the
Conservatory, I am the less surprized to meet
every





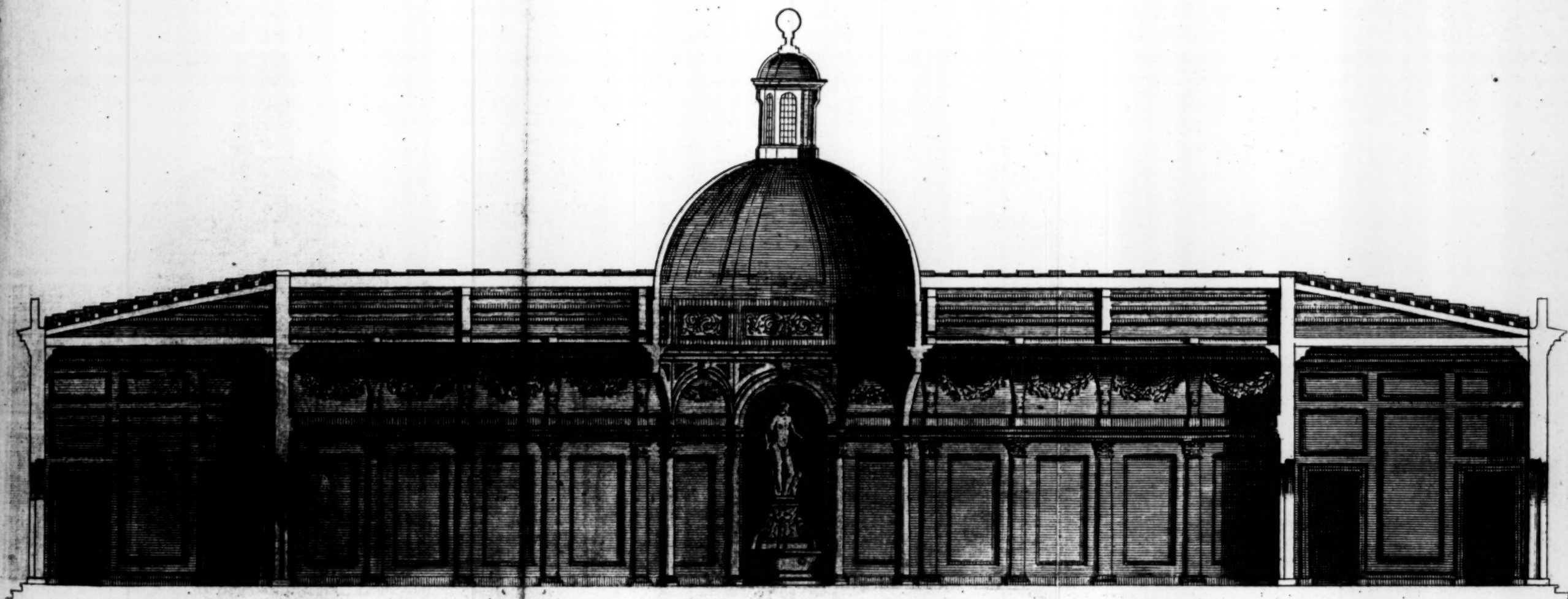
a scale of Feet.

10

20

30





a Scale of Feet.

every Day with valuable Collections of Trees half poison'd with Charcoal, or pinch'd to Death with the Frosts; and all this is owing to the ill Contrivance of our *English* Green-Houses, as I have mentioned in my *New Improvements*, Part III. 'Tis therefore I have consulted with *Seignier Galilei*, a most skilful Architect, about composing such a Green-House as might be agreeable to the Rules of Architecture, and at the same Time be rightly adapted to the Welfare of *Foreign Plants*.

Plate II. is the Plan or Ground-Plat of a Green-House which will be sufficient, with the following Directions, to explain the III^d and IVⁿ Plates.

A and B are two Rooms at the Ends of the Green-House for the Use of the Gardener, or to be employ'd otherwise, as our Fancy directs. These Rooms are Passages into the Green-House in the *Winter*, that the cold Air may not directly be let in upon the *Plants*; *ab*, in those Rooms are Places for Seeds, Instruments, Papers, Books, &c. and those mark'd *cc* for Beds.

C in the half *Decagon* are Benches for the most tender *Plants*, such as *Aloes*, &c. This Place is appointed for those *Plants*, because they may enjoy the Sun from its Rising 'till it Sets; and the *Cupola*, being all Glass towards the *South*, will still contribute to give them more of the Sun's Warmth; but the Pillars *defg*, which support half the *Cupola*, may be left out or kept standing at Pleasure; they will be Ornaments when the *Plants* are in the House, but are of no great Use in supporting the *Cupola*; the Roof alone may bear up that Part of it.

The Pillars *biklmnop* are of the *Corinthian* Order, as are the others, which support the *Cupola*; they are so disposed as to let the Sun

490 *A Description of a Green-House.*

Sun pass into the House with very little Interruption, which is the chief Thing to be considered in the Contrivance of a Green-House.

The Sashes of Glass must be of equal Height with the Pillars, and be so disposed, that they may slide easily in their Frames up and down, as we have Occasion to give Air to the *Plants* in the House; and they must also be so contriv'd, as to be flung up into the Freeze when the *Plants* are out of the House, so as to leave the Front open, like a *Portico* or *Colonnade*.

The Windows also of the Freeze must be made to slide down when we are disposed to let in Air at the Top of the House, which is often necessary.

The Sash Frames likewise from the Pillar *i* to *o*, may be made to run in Grooves, like the Scenes in the Theatre, so that we may inclose the *Semi-Decagon* when we give Air to the others which are more hardy.

DD are the Benches for the most hardy Green-House *Plants*, such as *Oranges*, *Lemons*, *Myrtles*, &c. They are so disposed, as to admit of Walks about them, for Convenience of Watering.

E is a Grotto and Fountain, very useful for watering the *Plants* in the Winter; for the Water in that Bason will be so temper'd with the warm Air of the House, that it will be nourishing to the *Plants*; which Water brought directly from without Doors would not be, but rather prove injurious to them; and I leave every one to judge how great an Ornament this will be, as well in Winter, when the *Plants* are in the House, as in Summer, when the House will be made a Room of Entertainment.

FF are two Chimnies, which serve as well to warm the Rooms at the End of the Green-House, as to convey warm Air among the *Plants*. [See the

A Description of a Green-House. 491

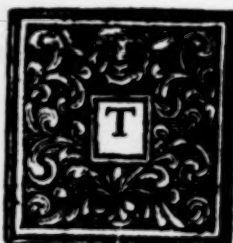
the Contrivance of these Chimnies in the Reverend Dr. Desagulier's Book intituled, *Fires improved.*] A Green-House contrived after this Manner, has little Need of Shutters to the Windows; for the Sun, and Heat from the Chimnies, will always keep the Air in the House so warm, that the Frosts cannot do the *Plants* any Damage; but in the most rigorous Season we may only cover those Windows in the half *Cupola* with Straw-Mats; for the *Plants* there, are of the most tender Sorts. Thus I have endeavoured to explain the Use of this Green-House, which is so ingeniously disposed by Seignior GALILEI: See the *Section* and the *Upright* of it, *Plates III.* and IV.





S T A T U T E S

For Preservation of Timber, Underwood, Fruit-Trees, Hedges, &c. including the Act of the 6th of King GEORGE I.



O render this Treatise of greater Use to the Publick, and that the Reader may be acquainted with the Laws for Preserving, as well as the Methods of Propagation of Timber Trees, Fruit-Trees, &c. I shall here insert an Account of the several Acts of Parliament on this Head, from the earliest Date to this Time.

The first Law I find in our Statute Books is 35 Hen. VIII. which enacts, That in every several Wood, call'd Coppice or Underwood, that shall be fell'd at twenty-four Years Growth, or under, there shall be left twelve Standils of Oak unsell'd in every Acre: And in Case there shall not be so many Oaks, the Number is to be supplied with Elm, Ash, Beech, &c. Which Standils shall not be cut down until they are ten Inches Square within three Foot of the Ground, on Pain that every Owner of such Woods shall forfeit for every Standil not so left, or left and afterwards cut down under Size, 3 s. 4 d. to be divided between the King and Prosecutor.

And

And if Coppice Wood be fell'd above twenty-four Years Growth, and there shall not be so many Standils left, the Forfeiture for each Standil not left, is made double, viz. 6 s. 8. d. And the Standils left must not be cut down (unless by the Owner of the Soil for Building, Repairs, Posts, Rails, &c.) before they are of sufficient Growth, under the like Penalty of 6 s. 8 d. each.

Underwoods felled at fourteen Years Growth, or under, shall, during four Years next after the twentieth of *April* ensuing their felling, be preserved from Destruction of Cattle, on Pain of forfeiting for every Rod unfenc'd, 3 s. 4 d. per Month: And Underwoods above fourteen Years Growth, and under twenty-four, are to be well fenced and preserved for the Term of six Years after felling, under the like Penalty. If any Beasts are suffered to come into a Lords fourth Part of Wood, wherein others have Common with him, and the same be set out within seven Years after the felling, the Owner of such Cattle shall forfeit for every such Beast 4 s.

Underwoods in a Park shall be preserved by fencing only four Years after felling. And if any Person shall break or destroy any Fence or Hedge made for the saving of any Woods or Underwoods, he is liable to the Penalty of 10 s. And Swine, about ten Weeks old, are not to be permitted to run in Wood Grounds, un-ring'd, on Pain of forfeiting 4 d. a-piece. Yearling Colts or Calves may be put into such Woods within two Years after felling thereof.

By the 13 *Eliz. c. 25.* all Woods or Coppices intended by Stat. 35 *Hen. VIII.* to be inclosed, and the Springs thereof preserved, shall be so saved for the Space of two Years more than by the said Act is limited, according to the Age of the

the Woods felled, upon such Pains and Penalties as in the said Act are contained: And no Person shall put any Cattle into such Coppice-Woods from the Time of the Fall, unto the End of five Years; nor from the End of five Years, any Cattle but Calves and yearling Colts only, until the End of six Years, if the Wood was under fourteen Years Growth; or 'till the End of eight Years, if it was above fourteen Years Growth at the last Fall.

The 23^d *Eliz.* enacts, That none shall convert into Coal or other Fuel, for the making of Iron, &c. any Wood or Underwood, growing within the Extent of twenty-two Miles of *London*, or of the River *Thames* from *Dorchester* in the County of *Oxford* downwards, or within four Miles of the Foot of the Downs, between *Arundel* and *Pemsey* in the County of *Sussex*, or of *Winchelsea* or *Rye*, or within 2 Miles of *Pemsey*, or 3 Miles of *Hastings*, on pain of forfeiting for every Load 40 s.

By 27 *Eliz.* none are to convert to Coal or other Fuel, for the making of Iron, &c. any sound Timber-Tree of Oak, Ash, or Elm, which shall bear a Foot square in any Part, in the Counties of *Sussex*, *Surrey*, *Kent*, &c. under the Penalty of 40 s. for every Tree, to be divided between the King and Prosecutor. The Penalty is the same (by 1 *Eliz.*) for Timber-Trees thus converted at any Place, within fourteen Miles of the Sea, or of the *Thames*, *Severn*, *Wye*, *Humber*, *Dee*, *Tine*, *Tees*, *Trent*, or other navigable Rivers.

But the Lops of Timber-Trees, may be converted to Coal, for the Purposes aforesaid, within the Wilds of *Sussex*, *Surrey*, and *Kent*; so as it be not within eighteen Miles of *London*, eight Miles of *Thames*, four Miles of *Rye* or *Winchelsea*, three Miles of *Hastings*, &c.

The

The next Statute is 43 *Eliz.* relating to robbing of Orchards, Hedge-breaking, &c. By this Statute, if any Person shall rob any Orchard or Garden, dig up or take away any Fruit-Trees, break any Hedges, Pales, Fences, &c. cut or spoil any Woods or Underwoods, &c. he shall, for the first Offence, pay to the Party grieved, such Damages as a Justice of Peace shall appoint: And if the Party be not of Ability to pay the Damages appointed, he shall be punished by Whipping.

By 15 *Car.* II. a Constable or any other may apprehend Persons suspected of stealing of Wood, Underwood, Poles, or young Trees, Bark of Trees, Gates, Stiles, Posts, Pales, Rails, Hedge-wood, Broom, &c. And by Warrant from a Justice of Peace, search their Houses; and if they find any of those Things, they are to carry the Person, on whom found, before a Justice; and if he cannot give a good Account how he came by the same, or in a convenient Time produce the Person of whom bought, or some Witness to prove the Sale on Oath, he shall make such Recompense as the Justice shall appoint; and pay a Sum not exceeding 10*s.* for the Use of the Poor where the Offence was committed; and on Default thereof, he is to be sent to the House of Correction for any Time not exceeding a Month, or be whipped; for the second Offence to be committed to the House of Correction for a Month, and be kept to hard Labour; and on committing a third Offence, to be adjudged an incorrigible Rogue.

If any Person shall be convicted of buying stolen Wood, one Justice may order such Buyer to pay treble Value to him from whom taken, and in Default thereof, commit the Offender for a Month. But Prosecutions on this Act must be commenced

commenced within six Weeks after the Offence committed.

In the first Year of King *George I.* an Act passed for encouraging Plantations of Timber-Trees, Fruit-Trees, and other Trees for Ornament, Shelter or Profit, and for the better Preservation of the same, &c. whereby it is ordained, That if any Person or Persons shall maliciously cut or spoil any Timber-Trees, Fruit-Trees, &c. they are to be committed to the House of Correction for three Months, and be whipped once a Month, in the Market-Town where the House of Correction stands, or in the next Town, &c.

And Persons maliciously setting on Fire, Burning, or causing to be burnt, any Wood, Underwood, &c. shall be guilty of Felony.

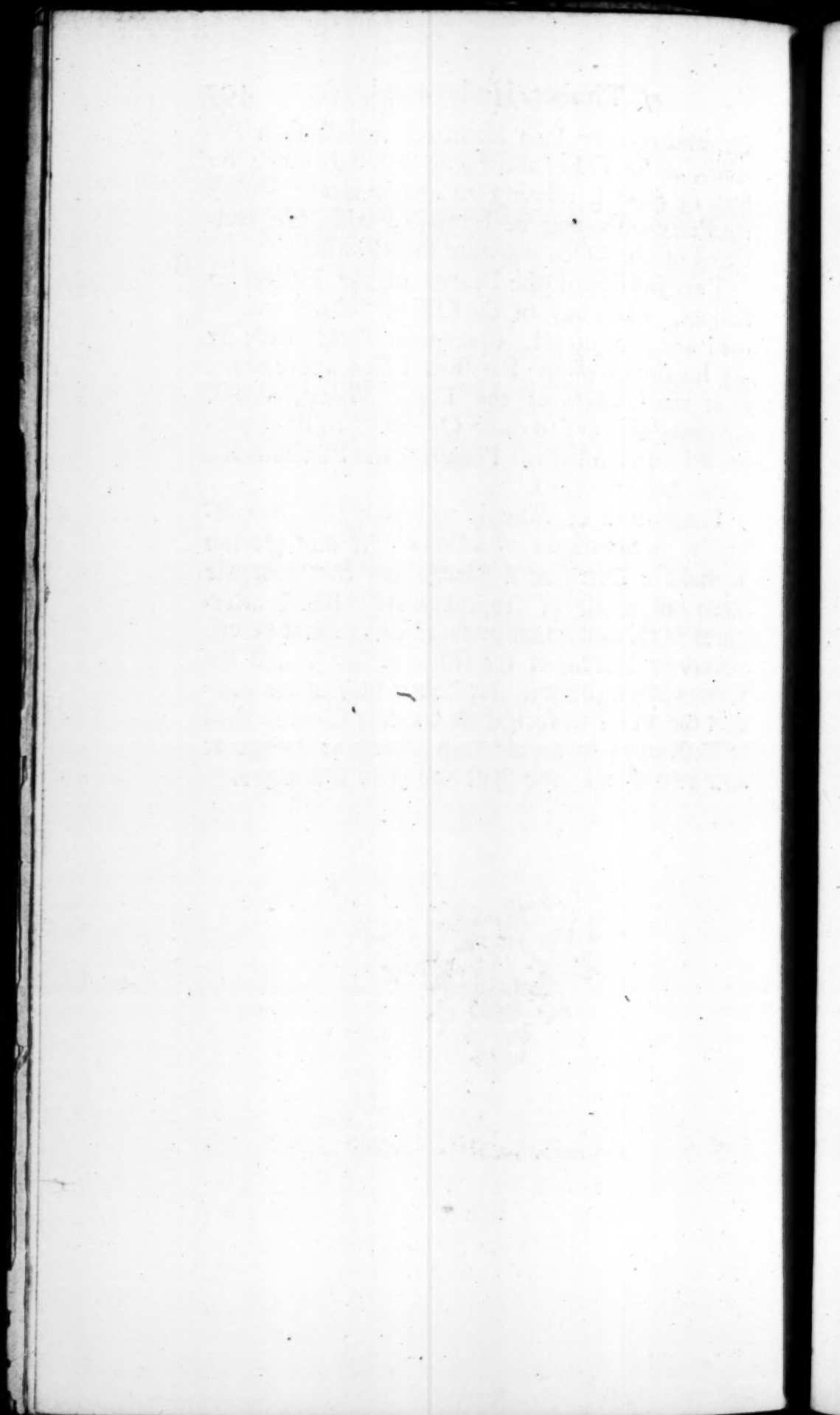
By the 6th of King *George I.* after reciting, that divers disorderly Persons in a private Manner enter the Woods, Coppices, Plantations, Parks, Chases, &c. of Lords of Manors, &c. and make great Destruction, by cutting down, breaking, taking, and carrying away Wood, Fruit-Trees, Poles, Springs, Thorns, Quickset, &c. And by throwing down and destroying Hedges, Fences, Walls, &c. It is enacted, That if any Person, either by Day or Night, shall cut, take, destroy, bark, pluck up, deface, spoil or carry away any Wood Springs, or Springs of Wood, Trees, Poles, Wood, Tops of Trees, Underwoods, or Coppice Wood, Thorns or Quicksets, without the Consent of the Owner, or shall break open, throw down or destroy any Hedges, Gates, Stiles, Walls, Fences, Banks, Ditches, or other Inclosures of Woods, Wood Grounds, Parks, Coppices, Timber, Fruit-Trees, &c. the Owners or Proprietors of the same, that shall be damaged thereby shall receive such Satisfaction of the Inhabitants of the Parishes joining on such Wood Grounds, &c.

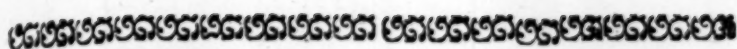
&c. and recover such Damages against such Parishes, as for Dikes and Hedges overthrown, by Stat. 13 *Edw. I.* relating to *Approvement*: Unless the Party offending be by such Parish, &c. convicted of the Offence within six Months.

Two Justices of the Peace, or the Justices in Sessions, when any of the Offences above mentioned are committed, upon Complaint made by any Inhabitant of the Parish or Place where done, or of the Owners of the Trees, Wood, Wood Grounds, &c. are to cause Offenders to be apprehended; and inflict the Penalties and Punishments in the Act 1 *George I.*

The Statute of *Edw. I.* to which this Act refers, is in Substance as follows: If any Person do make a Ditch or a Hedge for that Purpose (upon just Title of Approvement) which afterwards is thrown down by some who cannot be discovered by Verdict of the Assize or Jury, and the Towns adjoining will not Indict such as are guilty of the Fact; in such Case the said Towns shall be Distrained to repair such Ditch or Hedge at their own Costs, and shall also yield Damages.





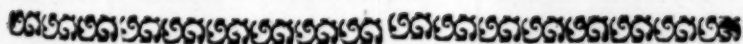


Herefordshire ORCHARDS,
A
PATTERN
FOR ALL
ENGLAND.

Written in an Epistolary ADDRESS to

Samuel Hartlib, Esq;

By *I. B.*







A N
EPISTOLARY ADDRESS

T O

Samuel Hartlib, Esq;

S I R,



OUR industrious Endeavours for the Benefit of all Men, and particularly for the Good of this Nation, hath well deserved the grateful Acknowledgment of all good Men, and of myself in special; for that in my rural Retirement, I have received some Profit, and very much innocent and refreshing Delights in the Perusal of those Treatises, which are, by your diligent Hand, communicated to the Publick.

My Education was amongst Scholars in Academies, where I spent many Years in conversing with Variety of Books only. A little before our Wars began, I spent two Summers in travelling towards the *South*, with Purpose to learn to know Men and foreign Manners. Since my Return,

K k 3

I have

I have been constantly employed in a weighty Office, by which I am not disengaged from the Care of our Publick Welfare in the Peace and Prosperity of this Nation ; but obliged to be the more sollicitous and tender in preserving it, and promoting it. Wherefore, taking Notice that this County is reputed the *Orchard of England*, and (in the Generality of good Husbandry) excelleth many other Places ; I offer it (as my Duty) to give you some plain and unpolished Account of our *Agriculture in Herefordshire* ; which I do the more willingly undertake, for that I do not yet know of any other Address is made unto you from this Country. Here I observe the wisest and best of our Gentry to be very careful in setting forward such Kind of Husbandry, as best agrees with the Nature of the Soil where he inhabiteth. From the greatest Persons to the poorest Cottager, all Habitations are encompassed with Orchards and Gardens ; and in most Places our Hedges are enriched with Rows of Fruit-Trees, Pears, or Apples, Gennet-Moyles, or Crab-Trees. Of these, the Pears make a weak Drink fit for our *Hines*, and is generally refused by our Gentry, as breeding Wind in the Stomach ; yet this Drink ('till the Heat of Summer hath caught it) is most pleasing to the female Palate, having a Relish of weak Wine mixed with Sugar. If mingled with some harsh Kind of Apples, it makes a happy Mixture ; and our observant House-keepers know how to mix them to the best Advantage. Some Pears are apt to incline the Drink to be roapy, and they are known by giving a wheyish Colour to the Liquor. I know a good Husband that cuts down and destroys such Pear-Trees from his Ground, calling them the worst of Weeds. For others are so nice as to refuse the Drink, and Women love it best, as sweetest, 'till
it

it be roapy. Most other Kinds of Perry are of a more waterish Colour, than Apple-Cyder, and more luscious. The white Horse-Pear yields a Juice somewhat near to the Quality of Cyder; and the Neighbourhood of *Bosbury* is famous for a peculiar Perry, which hath many of the masculine Qualities of Cyder. It is quick, strong and heady, high coloured, and retaineth a good Vigour two or three Summers; yea, in great Vessels and good Cellars many Years, before it declineth. The Fruit is so hard and coarse, that a Man cannot endure to bite a Morsel of it, and a Pig will refrain it. This *Bosbury* Pear is there called the *Bareland* Pear, and as the Liquor approacheth to Apple-Cyder in Colour, Strength, and excelleth in Durance; so the Bloom cometh forth of a damask Rose Colour, like Apples, not like other Pears. Our *Gennet Moyles* are commonly found in Hedges, or in our worst Soil, most commonly in *Irchenfield*, or towards *Wales*; where the Land is somewhat dry and shallow. This Fruit is nice, and apt to be discouraged by Blasts, and we do ordinarily expect a failing of them every other Year, especially in dry Soil; and the Reason is apparent and necessary. But this Fruit makes the best Cyder, in my Judgment, and such as I do prefer before the much commended Red-streak'd. For this *Gennet Moyle*, if it be suffered to ripen upon the Tree, not to be mellow, but to be yellowish and fragrant, and then to be hoarded in Heaps under Trees, a Fortnight or three Weeks before you grind them; it is (at a Distance) the most fragrant of all Cyder-Fruit, and gives the Liquor a most delicate Perfume. So for Tarts and Pyes, it is much commended. The Crab is commonly ground for Verjuice, and sometimes hoarded 'till near *December*, and then mingled with Cyder, or Washings of Cyder, to

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it be roapy. Most other Kinds of Perry are of a more waterish Colour, than Apple-Cyder, and more luscious. The white Horse-Pear yields a Juice somewhat near to the Quality of Cyder; and the Neighbourhood of *Bosbury* is famous for a peculiar Perry, which hath many of the masculine Qualities of Cyder. It is quick, strong and heady, high coloured, and retaineth a good Vigour two or three Summers; yea, in great Vessels and good Cellars many Years, before it declineth. The Fruit is so hard and coarse, that a Man cannot endure to bite a Morsel of it, and a Pig will refrain it. This *Bosbury* Pear is there called the *Bareland* Pear, and as the Liquor approacheth to Apple-Cyder in Colour, Strength, and excelleth in Durance; so the Bloom cometh forth of a damask Rose Colour, like Apples, not like other Pears. Our *Gennet Moyles* are commonly found in Hedges, or in our worst Soil, most commonly in *Irchenfield*, or towards *Wales*; where the Land is somewhat dry and shallow. This Fruit is nice, and apt to be discouraged by Blasts, and we do ordinarily expect a failing of them every other Year, especially in dry Soil; and the Reason is apparent and necessary. But this Fruit makes the best Cyder, in my Judgment, and such as I do prefer before the much commended Red-streak'd. For this *Gennet Moyle*, if it be suffered to ripen upon the Tree, not to be mellow, but to be yellowish and fragrant, and then to be hoarded in Heaps under Trees, a Fortnight or three Weeks before you grind them; it is (at a Distance) the most fragrant of all Cyder-Fruit, and gives the Liquor a most delicate Perfume. So for Tarts and Pyes, it is much commended. The Crab is commonly ground for Verjuice, and sometimes hoarded 'till near *December*, and then mingled with Cyder, or Washings of Cyder, to

make a mordicant Cyder, which doth well please our Day-Labourers; and would surely well agree with a *French* Peasant's Palate. And, for a fresh Wonder, I assure you, that we have lately found out, that one of our most delicate Kinds of Cyder is made of a Kind of a Crab, called a *Bromsbery*-Crab, thus hoarded; it being much like a Stomach Wine, of a very pleasing Sharpness. This Experiment is not yet known to many of our Country-men, it being reserved to few as a novel Mystery. I have sometimes try'd the Cyder of Pippins only, well ripened, not green Windfalls, nor over-ripen'd, and somewhat hoarded; and I find it to be a very pleasant Drink, and do conceive it to be the most wholesome, and most restorative of all Sorts of Cyder.

I need not tell you how all our Villages, and generally all our Highways (all our Vales being thick set with Rows of Villages (are in the Spring-time sweetned, and beautified with the bloomed Trees, which continue their changeable Varieties of Ornament, 'till (in the End of Autumn) they fill our Garners with pleasant Fruit, and our Cellars with rich and winy Liquors. Few Cottagers, yea very few of our wealthiest Yeomen, do taste any other Drink in the Family, except at some special Festivals, twice or thrice in the Year, and that for Variety rather than with Choice.

Orchards being the Pride of our Country, and the Scene of my present Discourse, I will offer unto you two Observations upon that Argument, as properly directive to them that can affect the Pleasure or Profit, which must needs be in many Respects, very much: As for that they do not only sweeten, but also purify the ambient Air, (which I conceive to conduce very much to the constant Health and long Lives, for which

which our County hath been always famous (and for that they fence our Habitations and Walks from the Stroke of Winds and Storms in the Winter, and afford us Shelter and Shade in the Heat of Summer; and (if I may acknowledge grateful Trifles) for that they harbour a constant Aviary of sweet Singers, which are here retained without the Charge or Violence of the *Italian Wires*.

My first Observation is this; I conceive that if other Countries would submit to the same Patience and Industry, as is usual amongst us, they might partake of a great Measure (at least) of the same Blessings. As we see in our Borderers of *Shropshire*, *Worcestershire*, and *Gloucestershire*, and also in *Somersetshire*; and much more in *Kent* and *Essex*, &c. My Reason I take from the wonderful Difference of Soils where we abound with rich Orchards. About *Bromyard*, a cold Air, and a shallow barren Soil, yet Store of Orchards of divers Kinds of spicey and savory Apples. About *Rosse* and *Weobley*, and towards the *Hay*, a shallow, hot, sandy or stony Rye-Land, and exposed to a changeable Air, from the Disgusts of the Black Mountain; yet here, and all over *Irchenfield*, and also about *Lemster*, both towards *Keinton*, and towards *Fayremile*, (which makes a third Difference of shallow and starving Land) in all these barren Provinces, as good Store of undeceiving Orchards, as in the richest Vale in the County, even by *Frome Banks*. Only, as I fore-noted, where the dryest Fruit-Trees are planted in a very hot, shallow, and dry Soil, there we must be content with a full and certain Blessing every second Year. This being also allowed, that some Soil and some Air is more agreeable for some Kind of Fruit, than for other; as for Example, *Worcestershire* is more proper

proper for Pears and Cherries, than *Herefordshire*, and *Herefordshire* more proper for Apples. The Reason of the Difference may, in Part, appear by this following Illustration. Where the Turf is very shallow, the rough starvy Ground (which in this Country we wrongfully call *Marle*) hinders the tender Root of the Apple-Tree from descending deep enough for due Nourishment, and fit Shelter. There is (in the Ground which we esteem the most barren) the Root of the Pear-Tree, having a more piercing Vigour, breaks his Way through this coarse *Marle*, as it will also cleave through some Veins of Rocks and Stones; and under this starvy Ground, it finds a more congenial and richer Nourishment; as appears by the Store of Fruit, fair and juicy, and also by the Rind of the Tree, smooth, bright-coloured, and free from Mofs. This we also note, That in a deep Soil, that is most kind for Apples, if the Root of a Pear-Tree descends deep into a soft clay Ground, the Tree spends all his Strength in growing downwards, and becomes less spacious, and less beautiful in the Head, and less fruitful. And where some Pears find great Difference of Soil, whether grafted or planted by the Stock, there it differeth sometimes in Bulk, and oft-times in other Qualities very much. Which seemeth to me to explain, why there are such different Kinds of Pears in every Country; their Shape and their Nature, and therefore also their Names being changed so often, and so easily.

Also I have frequently noted, that the richest Cyder, and the best tasted Apples for the Table, do grow in the Soil that is less deep and less commended for other Uses, as in a high Ground, or dry Land. And you shall find the better tasted Fruit to be more wretched or wrinkled, or spotted

ted with Warts, Moles, or Freckles, or of a more russet or yellow Colour. The other Apple that comes from the richer and lower Ground, is more pallid, more plump, but more waterish and insipid. I conclude this Observation with this Direction, That since no kind of Soil should wholly discourage us, and yet much Regard must be had of fitting the Fruit to the Soil; therefore we must employ our first Care in the Plantation of a Nursery, where our Experiences may daily increase, and the Plants also be educated, prepared, and fitted for the neighbouring Soil. For what Columella saith of Vines, I may as truly say of Fruit-Trees; *Quod ex longinquo petitur, parum familiaritur nostro solo venit, propter quod difficiliter convalescit alienum exteræ regionis. Optimum est ergo eodem agro quo vitem dispositurus es, vel certe vicino, facere seminarium; idque multum refert loci natura, &c. de Arbor. cap. 1.*

My second Observation is intended to encourage the Plantation of a Nursery by directing the sure Way how to fit the Soil with the greatest Variety of Fruits, and also to obtain the speediest Reward, together with a yearly Delight in Novelties, and a like Growth in Experiences.

But because I must now embark into some Paradoxes, which will not easily obtain Belief, and least of all amongst our own Countrymen here in Herefordshire, for some Reasons which hereafter will occur, I will make my Entrance with a plain and true Story.

Some Years ago I read a small Treatise of Orchards and Gardens written by *William Lawson*, a North Countryman, printed 1626. In it I found many Assertions which seemed to me so strange, so contrary to our general Opinion, so discordant

disordant from our daily Practice, and so incredible, that I could not forbear my Smiles. I related the Particulars to all our best Artifts. Every Man confirm'd me, that the Treatise was wholly ridiculous, and in no Respect worthy to be examin'd and weigh'd; yet I thought I found many Signs of Honesty and Integrity in the Man, a sound, clear, natural Wit, and all Things attested and affirmed upon his own Experiences. This raised my Wonder the more. Amongst many Particulars, some were as follow :

1. That the best Way to plant an Orchard were to turn the Ground with a Spade in *February*, and to set, from *February* 'till *May*, every Month some Kernels of the best and soundest Apples or Pears, &c. Finger deep, at a Foot Distance: And by removing the rest (as Time and Occasion should advise) to leave the likeliest Plant to reside in the natural Place unremov'd. *Cb. 7. pag. 17.*

2. That the Kernels of every Apple would bring forth Apples of the like Kind. *Chap. 7. pag. 18.*

3. That by the Leaves of each spiring Plant you might distinguish each Kind of Fruit, whether delicate or harsh, &c. *Cb. 7. pag. 18.*

4. That Apple-Trees, permitted to grow without grafting or removing, will endure a thousand Years.

5. That Apples either grafted, or any Time removed, could never be sound, durable, or otherwise perfect.

1. The first of these Assertions was rejected as dilatory, and retarding our Hopes and Reward for half an Age.

2. The second was contradicted by daily Experience, which voucheth, that many Apple-Kernels

Kernels will degenerate to Crabs, at least if taken from Apples planted on a Crab Stock; and that Crab-Kernels are better for a Plantation, than any Apple-Kernels.

3. The third Note was wholly unknown and unobserv'd in our Country.

4. The fourth, like an unreasonable Fancy.

5. The fifth, as refuted in all our Orchards every where.

Notwithstanding these Oppositions, I still retained my good Opinion of the Man's Honesty and Experience. Therefore I resolved to make exact Trial with Patience, I digg'd Holes of three Foot Breadth in a Parcel of ordinary Clay-Ground. [Note, That the whole Piece of Clay-Ground was turned somewhat deep with the Spade before, that the Settlings might gather Root as well in that vulgar Ground, as also in the finer Mould.] I acquired Slips of several Trees that grew without Grafting, and bore several Fruits of their natural Kind: These I placed each Kind round about the Verges of the several Holes. By diligent Enquiry the first Spring, I found fourteen several Sorts of these natural Apples, the Fruit much differing in Taste, Shape, and Colour; some only green and sowerish, some red-streaked, some party-colour'd, and very pleasant, some Table-Fruit in Summer, some Winter Fruit, some Cyder Fruit. Of all these the *Kentish Codling* was by odds the worst; not many better than the *French Cornel*. Having placed these Slips in the Border of the Hole at a Foot Distance, I filled up the Hole with a fine Kind of Garden Mould, carried thither in Barrows, This I raised not in Tumps, for I foresaw the Inconvenience, that it would be a Harbour for Ants and Pismires. I kept it also at an equal Level,

Level, that the Rain might not lodge there, and corrupt the young Roots. In the midst of this fine Mould, in the most temperate Weather, I did Monthly, from Autumn to the next Spring, set Kernels of the finest Sort of Apples, with delineating in a Sciograph the several Kinds in several Places. I now find that the Kernels of Apples grafted on Crab-Stocks, prove not all Crabs, nor (as I guess) altogether of the Kind of that Apple whence the Kernel was taken.

2dly, That, as the Mould is finer where they first grow, so the Fruit seemeth more civil; and in coarse Ground they degenerate towards the Crab. Our Neighbours, for a Nursury, sow the Drofs or Must (as we call it) of Apples ground in a Cyder Mill. But I have noted, the fairest Kernels to be bruised in the Mill, the Remainder being small, and sown in coarse Land, become a Kind of Crabs: And that the Kernels of natural Apples do very much propend to the Kind of which they are descended.

This was neglected; and therefore unknown to our Neighbours, who had no need of this Curiosity, as being so addicted to grafting, that they take not Notice of any natural Apple, except the *Gennet Moyle*, the *Kydoddin*, the *Sweeting*, and the *French Cornel*; which are found in all Places. 'Tis sure that Kernels of the same Apples; in a far differing Soil, do produce a different Apple; but (as I said) still with some Inclination to the Original, if it be the Kernel of an ungrafted Apple. And this may advertise the best Season of designing Variety; namely, in Application of choice Compost to the very Kernel, *Gabr. Plat* prescribeth *Exp. 14. pag. 210.* of the Additions to the excellent Legacy. All other Stories, of pouring
Liquors

Liquors into the Bark, or Bulk of the Tree, are effete and idle Fancies, for nine Days Wonder.

3dly, I find the Truth, and that much more might be added to *Lawson's* Rules, of distinguishing the Hopefulness of the Fruit by the first Leaves of the yearling Plant: For a short and dark green Leaf prognosticateth a crabbed Fruit: With a larger Leaf, and thick, but also dark green, I have found a good Winter Apple, but the Stock hardy, to endure a stiff Clay-Ground: A sady willowish broad Leaf noteth a flat insipid Apple, as the *Kentish Codling*, which holds out well against Blasts. A paler Green, as the *Poppinjay*, or *Barbary Leaf*, especially if the Leaf be limber also, noteth a delicate Fruit; and the broader the Leaf, the fairer that Fruit; A wrinkled Leaf, neither very dark, nor very light, proves red-streak'd, Crab Stocks have reddish Tops. More Particulars will occur by ordinary Observation.

4thly, For the incredible Durance of Apple-Trees, to a thousand Years, I have upon much Experience, and many Reasons, much abated the Presumption of my Censure. 'Tis certainly true (as *Gabriel Plat* in the aforesaid Place noteth) that if a Man aim at his present Profit, then grafting is his Way; but if he aim at the Profit of his Posterity, then it is best not to graft at all. This I add, that most ungrafted Apples are apt, by the Over-weight of their Fruit, to lean towards the Ground; and I have seen many of them quelled quite to the Ground; where they do renew their Strength, and get up again into many Trunks, in a continued Order, answerable to the old Fable of the Giant *Anteus*. Every aspiring Trunk of some of these natural Apples, is much more lasting than any grafted Fruit-Tree:

Tree: And many very aged People have assur'd me, that they have discerned no Difference either of their Growth or Decay, in their whole Age from their Childhood. I will tell you upon my Credit the Wonders of one Tree of this Kind, now growing in *Ocle Pitchard*: The Fruit is not very sappy, nor pleasant; the Leaf dark Green, and stiff. My known Friend (for Trial) made of that Tree five of our large Hogsheads, consisting of sixty-four Statute Gallons of Cyder, without the Mixture of any Water. It ordinarily yieldeth four Hogsheads, and seldom or (as they assure me that dwell there) never faileth of three; yet few of our Countrymen have heard of it, or take Notice of it. This Tree hath had very many Uprisings, so that I conceive it hath been many hundreds of Years making this Progress. My dear Alliance, Mr. *Thomas Taylor*, was Owner of it many Years, and dwelt always in that Parish. He is now past eighty Years old, of firm Strength and fresh Memory; yet he affirmeth, that he never could discern any Change in the Tree: And his Wife, for many Years, try'd to plant the Branches, but was utterly discourag'd by their slow Motion. I have for three Years try'd some Branches, which seem only to keep a faint Life, with very little Progress. The Ground on which this great Tree grows, is Pasture, and seems not in the Age of Man to have been broken up, or reliev'd with Compost, or fresh Mould; which may shew, that it is a very hardy Plant. So much upon the Adventure of my own Credit, which may be examin'd by a thousand Witnesses, to confirm the Credit, or rather Guess and Proposal, of Mr. *Lawson*.

5thly, For Duration of the Fruit-Tree, much Care must be had in the Removal, which should be soon after the Leaf is fallen, when the Au-
 tumna

humnal Rains, have softened the Earth at the Roots, that the Roots be not bruised or wounded in the Removal; and then the Tree should keep the same Position towards the Heavens; the Roots laid also in the same Posture, the smaller Fibres, or bearded Roots, rather cut at the Ends than crumpled up; and the Earth in which the Stock is laid, somewhat of the same Kind, but bettered and mellowed, not with undigested Muck, but with fine Mould, and Shovelings of the Fold. If the Roots are cut or bruised, to the same Proportion the Branches must be lopped. In a grafted Plant every Bough should be lopped, at the very Tops, in Apples and Pears; not in Cherries and Plums. In a natural Plant the Boughs should not at all be lopped, but some taken off close to the Trunk, that the Root at first Replantation be not engaged to maintain too many Suckers: And this must be done with such Discretion, that the Top Branches be not too close together; for the natural Plant is apt to grow spiry, and thereby fails of Fruitfulness. Therefore let the reserved Branches be divided at a convenient Roundness. The Branches that are cut off, may be set, and will grow, but slowly. If the Top prove spiry, or the Fruit unkind, then the due Remedy must be in grafting.

Neither is grafting to be used only as a Remedy; for it doth most certainly improve the Kind of the Fruit; insomuch, that a Graft of the same Fruit doth meliorate the Fruit, as is lately much observed by our *Welsh* Neighbours, who do graft the Gennet-Moyle upon the same Stock, and thereby obtain a larger Apple, more juicy, and better for all Uses: And some triplicate their Graftings (for a Curiosity) upon the same Account.

And it is noted amongst us, that a *Pearmain*, or any other pleasant Fruit, either for Cyder, or for the Table, is much sweeter, if grafted upon the Stock of a *Gennet-Moyle*, or *Kydoddin*, than if grafted on a Crab-Stock; though much less lasting upon the Stock of the *Gennet-Moyle*: The *Gennet-Moyle* being also less lasting, especially amongst us, where they are generally planted of large Settlings, which must needs wound them in their very Beginnings, and therefore hinder their Duration.

Also Grafting doth much precipitate, or at least expedite the Reward, especially if the Graft be taken from a Branch that hath some Years constantly borne sound Fruit plentifully. Trust not to one Year's Trial. *Potest enim vel anni proventu, vel aliis de causis, etiam naturaliter infecunda semel exuberare: Sed ubi plurimis velut emeritis non eum stipendiis fides surculo constitit, nihil dubitandum est de fecunditate: nec tamen ultra quadriennium talis extenditur inquisitio*, saith *Columella* in a like Case; *lib. 3. c. 6.*

1. Thus we see how to hasten the Reward, both by Grafting, and in the Choice of the Graft.

2. And how to sweeten the Fruit and better it, both by the Choice of a pleasing Stock, and also of a kind Graft.

3. And how to multiply Variety in the Diversity of Compost, especially at the first Plantation of the Kernel; and I add, with frequent Application of pleasant Infusions and Liquids, as in which Anise-Seeds, Fennel, Rosemary, or other agreeable Aromaticks have been steeped:
Yet

Yet beware of giving too much Juice to a young Plant; for that may drown it, or make it less fruitful: And I never saw an Orchard prove, where the Ground was wetted with a Water-Gall, or where the Moisture did for some Time lye there, and could not be drained away. Yet near a running Sink of soiled Water, I have seen the approaching Trees never fail of their Fruit.

4. And hence we see how to plant an Orchard that may probably remain to the World's End. And in this Point I have insinuated some Part of my Paradoxes, by the Way of a Story, and in Pretence of defending another against the Opinion and common Practice of mine own Countrymen. Mr. *Lawson's* Book I have not now at Hand, neither can I record his Judgment verbally, but I think I have stuck close to his Sense.

He addeth, that the Fruit of the natural Plant doth grow better and pleasanter by Time; as better at thirty Year's Growth than at twenty Year's Growth. This I know not. See *Chap. vii. pag. 18. 19.*

Also he requireth much more Distance of the Trees than we observe, as sixty Foot at least. Our common Orchards are at twenty Foot Distance; our best Orchards at thirty at least, by alternative Rows *per Quincuncem* * * * * * (as in the Margin.) In large Crofts * * * * * of Arable, reserved for constant * * * * * Tillage, which is a necessary Help * * * * * to Fruit-Trees, our best Husbards * * * * * graft high, and prefer *Lawson's* ut- * * * * * most Distance, even sixty Yards, * * * * * that the Teams may not annoy the Trees; and then

then the Trees bear a full Load of Fruit, and spread to the natural Perfection. This I add, that if you would have the Trees grow tall, and shadow more in Summer, and keep off Winds better in Winter, and the Fruit the sweeter, then you should plant the closer together, never nearer than twenty Foot.

To conclude my Paradoxes: He that is provided of a Nursery, need not be very nicely provident for the Longevity of his Trees. A small Parcel of Ground will furnish Store for all his Grounds, and for all his Neighbourhood, to play away upon Graftings and novel Experiments. And to encourage this Nursery, I now sum up all with my last Paradox, That for these four last Years, whereof two were very dry Summers, I laid the fruitful Sprays of natural Apple-Plants in the Ground, some very small, not two Foot above Ground, all thereabout; and from the first Summer to this present Spring, they never failed to bear as thick as Traces of Onions. But it is better for the Plant, if you pull off the young Apples soon after they are knitted, the first Year at least. Some I laid also of four Yards Length under the Ground, the Sprays lying slope above Ground: These grow and bear incredibly. Others I slope, and pare away the bordering Turf, that the reflected Sun may give me the early Benefit of a Dwarf Orchard; and these, against *Midsummer*, are as big as a Lady's Fist. I present them to store of Witnesses. If I dwelt near *Cheapside*, I should make my new planted Nursery as rich as an Orchard. All natural Apples are not of this Precocity: The more durable, as I said before, are much more sullen. Some require a Knot for the Root, others not: All
three

three the better for it. To some a small Slice of the Bark is as good. Before *December*, whilst the Spray grows on the Tree, by the Bluntness of the Bud you may discover what Branch will bear Fruit the next Summer immediately following, if you cut off the Branch, and set it before the Buds be sprouted too far forward, (as you may in *February*, or the Beginning of *March*.) This, with some, will pass as a Prophecy. A fore Blast, or *May* Frosts may deceive you. Of these natural Apples there are not past six or seven Kinds distinguished by proper Names amongst us. I conceive they can never be distinguished, for that every Individual always assumes a peculiar Nature from the infinite Variety of Compost. In this Nursery, 'tis the same Pains, and no Charge, to try the Seeds of *Firrs*, *Pines*, *Cypress*, *Pitch*, &c. which prove better for Replantation than in Hot-beds.

Of the Art of Grafting, either with the Cions, Bud, or Leaf, I shall say nothing, because every Village amongst us yieldeth Store of Artists; and many Books shew the Rules; but in these Things an Artist can teach more in a Day, than a Book in a Month.

One Reason why Fruit doth so abound in this Country, is, for that no Man hath of late Years built him a House, but with special Regard to the Proximity of some Ground fit for an Orchard, which should be of some Depth, as is commonly towards the Foot of a descending Ground, and frequently with a Proclivity towards the South; and the Land not too friable or hollow, but somewhat tough, binding, and tenacious, lest the Winds root up the Stocks. And many Times Servants, when they betake to Marriage, seek out an Acre or two of Ground, which they find

fit for Orchards; for this they give a Fine, or double Value for Years or Lives; and thereon they build a Cottage, and plant an Orchard; which is all the Wealth they have for themselves, and their Posterity.

For Gardens, we have little Encouragement to design more than is for the necessary Use of our own Families, except our River *Wye* may be made navigable for Transportation. And by Defect of Transportation, our Store of Cyder is become a Snare to many, who turn God's Blessings into Wantonness and Drunkenness: The Credit of Cyder being of few late Years much advanced in the Estimation of our best Gentry, who have sought out the right Method of ripening and hoarding the choicest Fruits, and of finding the right Season of drawing it, and some also of bottling it. But I am confident that much more may be added to the Perfection of it, when they shall also apply to it the due Subtilties of the mysterious Art of Fermentation.

I found it much amended, by putting pure Cyder upon the fresh Lees of a But of Sack newly drawn.

In Vines our Gentry have lately contended in a profitable Ambition to excel each other: So that the white *Muscadine* is vulgar, the *purple* and *black Grape* frequent, the *Parsly Grape* and *Frontinac* in many Hands.

Wallnuts belong to our Highway Sides, and are fittest for dry and stony Grounds. I find them for the dryest Ground of the Nursery a never-failing Companion. In *Columella* we may find many excellent Rules how to ascertain and hasten their Growth, and to mend their Quality.

The

The large Chesnut being such a masculine Food for lusty Rusticks, and so much used at the best Tables in *France*, and so savoury in the Con-
diment of our strongest Cyder with Salt, I much blame our Countrymen, that we have no more Use of a Food that would soon become cheap, common, and lasting.

All these Nuts and Filberts do accelerate Growth, as I have proved, by the Rules of *Columella*: *In aqua mulsa, nec nimis dulci mace-
rato, ita jucundioris saporis fructum cum adoleve-
rit, præbebit, & interim melius & celerius fronde-
bit, lib. 5. cap. 10.* And again, *de arb. 22.* I cannot tell whether it should not be read, *nec ni-
mis dulci*; but I try'd it in Milk, and also in stale Urine steep'd in Sheeps Dung, with good Suc-
cess. He adds, for an Improvement, *Et in me-
dulla ferulæ sine putamine nucem Græcam vel avel-
lanam abscondito, & ita adobruito.* A worthy Per-
son try'd the Kernels of Cherry-stones and Plumb-
stones, having first broken and cast away the Shells, and setting them in Summer Time, as soon as they were ripe; and he assureth, that they got a Year's Advantage in Celerity.

I do much wonder that such a singular honest Man as *Gabriel Plat* should write, that it is found by Experience, that a Chesnut in ten or twelve Years will grow into a fair Tree, able to be the Master Post of a fair Building. And the like of the Wallnut, *Exp. 13. pag. 269. Addit. to the Legacy.*

I am at the like Wonder at honest Capt. *Blithe's* Precedent of small quickset Oaks, that at eleven Years Growth made Spars and small Building-Timber, *Chap. 25. pag. 158. Edit. 1652.*

Our Elm is of speediest Growth, all Timber, always shredded to be the tallest of *English* Trees; and found in Rows in our Highways, and at every Cottager's Door, except they be compell'd to give Place to Fruit-Trees.

In many Journies through *Shropshire*, I have scarce seen two Elms of the right Kind. The Crust of the Earth there is too shallow. But the Root of the Oaks cleaves through the harder Earth, and surely finds a Marley Substance for his plentiful Sustenance to the full Depth of his Stature,

*Quod quantum vertice ad auras
Æthereas, tantum radice ad Tartara tendit,*

Georg. 2. ♀ 101.

All our Hills have sometimes borne Oaks, or few fail'd, and I conceive most are very apt for it. But of late the Iron-Mills have devoured our Glory, and deflower'd our Groves.

We are generally noted to excel in all Kinds of Husbandry; our Ploughs are light; but we listen after further Directions which come to us through your Hands. The Rye of *Clebanger* and of some Parts of *Irchinfield* is as good as the Muncorn or Miscellane of many other Countries; and our Wheat is upon the Ground far richer than I saw any in the fair Vale of *Esome* in *Worcestershire* and *Warwickshire*; as in my Travels, I sometimes examin'd it in the Company of other more skilful Husbandmen.

For Pastures we add Improvements daily; and as a Stranger passeth by our Habitations, by our Fences, Orchards, Pastures, Arable, he may distinguish a well-ordered Housekeeper and a
Free-

Freeholder, from an over-rack'd Tenant and an Unthrif.

This is the Country where *Rowland Vaughan* began his Water-Works; and I can name you a great Number of admirable Contrivers for the publick Good.

The Lord *Scudamore* may well begin to us, a rare Example for the well-ordering of all his Family, a great Preserver of Woods against the Day of *England's* Need, maintaining laudable Hospitality regularly bounded with due Sobriety, and always keeping able Servants to promote the best Expediences of all Kinds of Agriculture. And Sir *H. L.* hath heartily prosecuted the same Encouragements. Our learned Mr. *B. H.* drives on the same Design, as far as the Glances of a most sedulous Employment will permit. Mr. *R. of L.* is excellently apt, and constantly diligent in the Pursuit as well of Delicacies, as Necessaries. Mr. *S. of W.* hath in few Years raised an under Tenement, from 8*l.* yearly, and so rented, to be well worth 60*l.* yearly, and so rented, or thereabouts. He never fails in any Point of good Husbandry. Mr. *F. of B.* hath raised his poor Pastures from the Value of 2*s.* 6*d.* to be better worth than 20*s.* yearly. *C. M.* hath metamorphosed his Wilderness to be like the Orchards of *Alcinous*; herein also a hearty Patriot. I must cease to name Men, since in every Village there is some excellent Republican.

With one sad Note I must now conclude this Discourse. I wish this sore Proverb, *Bona Terra Mala Gens*, may not belong to us. The Most High hath filled us with his Blessings; but we fail so much in returning due Thanks, that we many Times turn his Blessings into heavy Curses, and make his liberal Gifts the prevailing Cause
of

of our hasty Ruin. And whereas the rural Life should, in all Reason, be the most humble, and tame, and innocent; yet daily Experience sheweth, that where any Trade of Manufacture is driven on, there the Word of God bears a Price: Where Trade thrives not, there the Word of God is, at the best, but a pleasant Song: If sometimes they hear it, yet seldom they obey it. And all Doors and Highways are oppressed with idle and sturdy Vagabonds: And it is more easy for an honest Justiciary to do the Work of *Hercules*, in cleansing the *Augean* Stable, than to remedy such a customary and prevailing Evil. Our fresh Expectation is, that some worthy Patriot will break through the Difficulties of an obstructive People, and force open a Way for Trade and Commerce. Let our Prayers and Importunities press on all true-hearted Patriots thus to advance the Publick. For this Adventure is, without Dispute, sure of a Reward in Heaven, and not only free from the Envy of Men, but always acknowledged to deserve everlasting Monuments of Glory. And thus also, in the Person of another (as under a fit Veil of Modesty) I briefly hint unto you, what Esteem we do truly owe unto your Labours. I pray the Lord to remember your Diligence in the great Day of his Appearance in Glory.

May 3,
1656.

Your hearty Well-wisher,

and obliged Servant in the Lord,

I. B.



POSTSCRIPT
TO THE
EPISTOLARY ADDRESS
TO

Samuel Hartlib, Esq;

S I R,

AVING employed one Day, upon a long Letter to you, concerning Orchards, and the Culture of *Herefordshire*, and the Messenger being not yet gone, I shall now add somewhat, or at least sum up the Result of my former Discourse.

The Ground for an Orchard should rather incline towards the *South*, than towards the *North*: Yet no Necessity of Niceness in that Point. They prove well towards the *North*. So rather towards the rising Sun than towards the *West*. Yet the *West* Wind is the best, and the *Western* Sun best ripening. And the Blasts commonly come from the

the full *South*, and about Noon: Wherefore we pray with the *Psalmist*, *To be delivered from the Evil that flieth at Noon-tide.*

Yet a diligent Observer may find, that the hurtful Winds are apt to gather into Channels upon the Surface of the Earth, as the Streams of Water do: And a Man may find by his Eye and Reason, and see it confirmed by anniversary Experience, that at a Mile's Distance, one Point of the Heavens is far more agreeable, or hurtful, than another, either by the Conduct of Hills and Vales in the Neighbourhood, or at a Distance, or by Vapours arising from Lakes, Rivers, or Moorish Grounds, which by Frosts are turned into Blasts. For we have confirmed it into a Proverb, that dry Frosts do not blast, but moist Frosts, and Frosts following after Rain do; and dampy Grounds make Frosts, that would be dry in other Places, become moist in the Neighbourhood. Also sometimes in a very Bottom, the Air is penn'd so close, and the Sun's Heat so multiplied by Reflections, that it is apt to gather the *Southern* Blasts (which, as I said are the more frequent, and more hurtful to the nicer Fruit, and to Hops) as in a Furnace or Oven.

If the Crust or richer Surface of the Earth be near a Foot deep, it is fully enough: And if the Crust of the Earth be deeper, yet I have seldom seen any of our Stocks set more than a Foot deep, except they be great Stocks, which should keep their former Depth.

If the Ground be equable, that is, in any Proclivity relating towards a Level, than it is pity to stock it with natural Plants. The more expedite Way were, in *October*, to settle Crab-Stocks at thirty Foot Distance in the fore-mentioned best Order, *per Quincurcem*: And after three Years, the

the next following *Spring*, send for an Artift to graft them with the best Fruit.

The Crab-Stocks should not be above the Bigness of a Man's Hand-wrist: If bigger, 'tis less apt to close with the Graft, and then the Rain finds a Hole to the Danger of the Stock. Our usual Custom was upon the plain Stock to set two or three Grafts, which (for Variety) might be different, without any Hazard or Damage. Of late, many do slope the Stock for one only Graft, conceiving this the more certain Way to unite the Stock, and graff fully and speedily. In a Nursery, if the Stocks be as small as Twigs, the surest and speediest Way is by the Joint-Graft, where no less than eight Sides are engaged, and this is an Improvement of the last Stamp.

We cannot trust to any Artift, but have need to use a true and careful Friend in the Choice of Grafts from the fruitful Branch of a sound and fruitful Tree. And an Error in this Point (besides the Mistake of the Fruit) may prologue the Reward for five Years or more, which is a sad Loss. *Columella's* former Note is worthy to be remembered in this Point.

If the Ground be very unequal, 'tis a great Charge, and a very gross Vanity to level it. For there is a Kind of Beauty, and a sure Refreshment in a Wilderness; at least it is a good Soil if appendant to a pleasant Garden. And it may be better, more Kind, and more fruitful, most certainly more fit for Variety, and for all Change of Seasons, by Inequality, than by Equality. And this is the Ground that is fittest for the natural Apple, who is then wronged, maimed or wounded, when he is hindred from his natural Course, or forced into Order. Yet I should not plant him
I in

in such Bottoms, where the Water cannot pass away: The Descent were best for his Situation.

The Apples we commend for Grafts, are the *Stockin Apple*, the *Jelly-flower Apple*, the *Well-Apple*, the *Eliot*, the *Queen-Crab*, the *Quince-Apple*, the *Winter-Quining*, the *Harvey*, the *William*, the *Leonard*, the *John-Apple*, the *Snouting*; not forgetting the *Pearmain*, and *Pippin*, and *Leather-Coat*. These and many more that are nameless, are for the Table.

For Cyder, the *Streak'd-Must* is most commended; but 'tis but a Kind of Shrub or Hedge-Plant, not apt to grow to a large Tree, and spending Strength so thick and so constantly, that the Planter commonly survives to see the Decay of his own Work. There is a *White-Must*, much commended for strong lusty Cyder, the Tree long lasting. Another *White-Must* hath this Fault; they abide not on the Tree, to be gathered together, but are always dropping one after another.

I need not note such Cautions as may afford Choice for all Seasons, early and late, and in the first Stocking of the Ground to plant Pears and Apples alternately, at least if we have no Certainty of the Nature of the Ground; and there is a Beauty as well as Profit in Variety: And Pears grow long before they take up much Room, and for the most Part begin to be in Perfection, when the grafted Apple is decay'd. Or a Winter Apple which lasts longer, and grows slower, may be alternative to a Cyder-Apple.

The Clay-Land binds the Tree faster from Wind-Stroke, the Sandy-Land hasteneth the Growth more. By Rows of Elms every Orchard and Village is generally fenced from the North and North-East Winds; yet no Necessity.

For

For Hops, we make Haste to be the chief Hop-Masters in *England*; our Country having Store of Coppice-Woods, and many provident Men, within these three Years, planting Abundance of the fairest and largest Sort of Hops. All about *Bromyard*, in a base Soil, there is great Store. At first we adventured only upon deep, low, rich and moorish Grounds; now we climb up the Hills with wonderful Success. We find also that the Bottoms are apt to gather Heat as an Oyen, (as is abovesaid) and that begets Honey-Dews, when the more open Air escapes it.

Our Poets, New and Old, and all best Judgments, do highly commend the Pleasure of a Grove, *Horat. 12. Epist. 2. Scriptorum chorus omnis amat Nemus, & surgit urbes.* We do commonly devise a shadowy Walk from our Gardens thro' our Orchards (which is the richest, sweetest, and most embellished Grove) into our Coppice-Woods or Timber-Woods. Thus we approach the Resemblance of Paradise, which God, with his own perfect Hand, had appropriated for the Delight of his innocent Master-piece. If a Gap lyes in the Way between our Orchard and Coppice, we fill up the Vacancy with the artificial Help of a Hop-Yard, where a busy Weed gives the Shape of a Wood. This must content us, till we can gain the Credit of a Vineyard, which as yet hangs between Hope and Fear. The late dry Summers did swell us with Hopes; the latter fickle Spring and moist Autumn, did blast, or drown our Expectation.

Some sow Acorns, and Ash-Keys, and other Seeds for Woods, in wild and hilly Grounds. Others count it much better to plant Quick-sets, which

which make more Haste, and may be more reducible to the Beauty of Order.

Before we adventure for Woods upon untried Ground, 'tis not amiss to make Use of Sir *Hugh Plat's* Augur. Myself having bought a small Tenement, thought it worth the while to see the Nature of mine own Land for nine Foot Depth, which was soon done. By that, I found where Sand, where Stone, and where Marle of the best Sort were nearest at Hand: I found the Reason why one Piece of Arable was more cold and moist, and less fruitful, than another.

We have a Belief, that the most barren Surface hath the richest Entrails, not only of metallick Minerals, but also of Stone, yea of Marle, or some other rich Material. And this is certain, that which we esteem the richest Land, and buy it at the dearest Rate by far, that is, in many Respects, the poorest Land: As for Example, our richest Land is esteemed to be on *Frome* Banks, the Pasture very rich, the Arable a stiff Clay, bearing the best Wheat; yet this Clay is very unkind for Gardens, it does devour much Compost. It is a slow Ground for Orchards; the Arable is much inclinable to the Mildews: If we have need to turn it into Pastures, though we have great Advantages of Land-floods, or other fat Waters, and the Ground seem very likely for Pasture, yet it is almost as good to give it away, as to go about to turn it into Pasture. I have seen that in twenty Years it gathers not a Turf, or Sward. Yea lately the want of Winter-floods two Years together, left the Pastures as bare, hard, starvy, chapt and cheany, as the basest Land upon the *Welsh* Mountains. And if the Arable be there once out of Heart, or miss of one Course of plowing, it is costly Work to recover it.

On

On the contrary, in many Places of the hot Rye-land, where the Pastures have a coarse Sea-green Blade, or short and poor, and where the Fields refuse Wheat, Pease, and Fitches, there Sheep thrive best, and their Dung suddenly recovers the Arable, which is light and easy for a weak Team: In three or four Years, 'tis at the best for such Pasture as it proves. The Pastures quickly improved by fattening Sheep there, that may lye upon it Night and Day. The Land quick for Orchards, or any Sort of Trees, as well the tallest Elms as the Ash; easily fitted for Gardens, for Hemp, Flax, Turnips, Parsnips, &c. Hence you may judge, which of these were more worthy to be called the Richer Land; if the rich Water-floods did not give the rich Pastures the Advantage on one Side. And hence you may see what Prevalency there is in the Advantage of Pasture only.

I have seldom seen Pastures forced by Compost in this Country, as I have seen elsewhere. Only in the Winter we feed our Cattle on the higher Pastures, and in the Hazard of a Rot, some follow the Directions of *Gabriel Plat*, in putting out their Sheep all Nights; which hath proved a Safeguard to the Sheep, and a great Help to the Pasture. Other Helps of Pasture we do omit, every Rill of Water is carefully conducted to the best Use. If it runs from a fat Stream, Land-flood, or Lime-stone, we find Benefit in it, if withal we let it pass over and away, before it exchangeth its Fatness into a cold Hunger, which falls out in a very few Days. Some Water we find so hungry, that we dare not receive it, but at Seasons of Necessity. Lime we have seldom tried upon Pasture. Ashes we find excellent to beget the white and purple Honey-suckle, if sifted

on the Ground in *February*, 'till it hath half candied the Ground, like a Hoat-Frost. Our best *English* Hay-seed is, by Experience, found to be our more natural Friend.

Our Grasiers, which are Butchers, do find this Fault in the excellent Pastures stored with Gilt-cups, which is a Kind of Crowfoot, that it makes the Fat of their Beef turn yellow, as if it were of an old Beef.

The Honey-suckle and Grass we sort for Cows, the sowerer for the Breed of young Cattle, the harder and stronger for labouring Oxen: and if it be rough, and little better than Sheep-Pasture, 'tis the better for Horses, to mend the Breed of them for the Saddle. In an Hyperbolical Excess, for the fuller Illustration, I may say, that a Nag fed upon high Grounds and dry Grounds, is, for Travel, as much beyond a Nag I bred in the lower Meadows, as a *Lion* exceedeth a *Cow* in Activity. For a Bag to Market, or a Cart, you may breed them in the lower Meadows, and you shall see them big-limb'd, well-truss'd, and apt to tire themselves with their own Bulk and Weight. The others that are bred on dry Ground, are Airy and Sinewy, full of Spirits and Vigour, in Shape like the *Barb*: They rid Ground, and gather Courage and Delight in their own Speed. Thus Colts well chosen, and Sheep well ordered, may be a rich Help to repair the Distresses of dry Pasture.

For Sheep we are skill'd beyond the Rules of *Gab. Plat*, our Wool being the finest of *England*, and our Sheep small, and not bearing above sixteen Ounces ordinarily (yet I have seen our fairest Weathers bear thirty Ounces of Wool); being small and nice, they are generally housed by Night, Summer and Winter. And are therefore

liable

liable to two Kinds of Rot: The one is only of the Liver at first, and if it be discerned, 'tis cured by the Butcher's Knife, without much Loss to the Owner; the other prevails over the whole Body of the Sheep, and makes the Flesh fit for nothing but Dogs. I know some Places, in which there hath not been a Rot in the Memory of any of the Inhabitants; but there they change often, because the Ground is very stony, and, in two or three Years, wears out their Mouths: And nothing preserves Sheep better than Change of Soil. Our common Husbandmen keep their small Flocks at all Adventures, without much Care or Caution. But for larger Flocks our Shepherds of *Lemsteroer* and *Irchinfield* are most incomparably expert.

Whilst this Letter is under my Hand, by a Conference with Mr. S. concerning Orchards, I am assured, that upon along Trial (as in a Way of Contestation) it was found experimentally, that some Apples, raised of Kernels, did exceed the best that could be found of grafted Apples in Delicacy of Taste.

That he tried to meliorate the *Kentish* Codling, by a Graft of the same Kind, and it proved worse.

That a near Neighbour made a Hogshead of Cyder of *Kentish* Codlings only: He tasted it this very Week. It had a Taste far differing from all other Cyder, not bad, nor very excellent. That it looks like Perry, of a wheyish Colour.

He also gave me at his own House a most pleasant Drink, which I thought to be Cyder, and perserr'd it before Red-streak'd Cyder, which was of the best, and, for Trial, brought out to me and others at the same Time. This com-

mended Drink was compounded of Crabs never hoarded, but shaken from the Tree, and immediately ground together with Perry of that luscious Kind, which, at this Time of the Year, is always wont to be roapy. This Drink was not clear, but had some Resemblance of roapy Perry. But he assures us, that the Crab does by this Composition always preserve the Perry from being roapy. If so (as of all Men I can best believe him, who will not break his Word to save his Life) this is an excellent Art, at one Time to make Crabs, which grow naturally in all wild, dry, and barren Soil, a rich Fruit; and by them also to make a rich Benefit of those Pears, which, in the Language of another good Husband, were called a cumbersome Weed.

He prescribeth that the more luscious the Pear be, the more Crabs be added to it. By the Taste in the Mill, you may fit it generally more Pears than Crabs. He noteth that these Crabs were not of the forementioned *Broomsbury* Crabs, but common Crabs; of which common Crabs he advertiseth there are two Sorts. The first soon ripe, and yellowish, and fit to be mingled with the Pears that are first ripe. And of this Kind was the Cyder that he gave to us. The other is a more fullen Crab, green about the End of Autumn. This agrees with its contemporary Pears. Or to make a Kind of *Scybian* Wind, fit to quicken the Palate of a sturdy Hinde, they may be laid in Heaps for a Month's hoarding, and then ground by themselves, or with Winter Apples. We know how welcome to foreign Peasants, and also to our Seamen, a rough Vinegar or Verjuice would be, either to mingle with Pottage, or with Water for Drink. We have not yet felt so much Want in *England*, as were
necessary

necessary to teach us the Use of Crabs or other general Branches of Frugality. The *Broomsbury* Crab, so often mentioned, is far larger than either of the Sorts, and in Shape like an Apple.

SIR, 'Tis Time I should now give you Rest. In this you may see my hearty Desires towards the Improvement and Welfare of our Native Country. If we must be hindred of Trade with *Spain*, I wish our *English* Indignation would scorn to feed at their Tables, to drink of their Liquors, or otherwise, to borrow or buy of them or of any other of their Confederates, as long as our Native Soil did supply us with Necessaries. I pray God to strengthen us all in a firm Love to his holy Truth, and in a mutual Love to each other, under the Shelter of his everlasting Mercies.

Hereford,

May 13,
1656.

Your Servant in the Lord,

I. B.

*An Extract of Mr. Hartlib's Letter, dated
September 4, 1656.*

He desires, that these Letters may be presented to publick View, for an Example to worthy Men in other Countries to do the like in these, and other Parts of Husbandry. That the *Latin* Passages should be turned into the vernaculous Language,

guage, and many Expressions altered into more plain and common *English*, that all vulgar Capacities may understand them, &c.

The Answer.

1. That it is now too late to polish any Parts of those Letters with such Accurateness, as becomes a Piece dress'd for severe Judgments. If it must flie abroad, it must go as it is, all Parts alike, in the free Garb of a natural Simplicity; written with Speed, and with more Care of Truth, than of fit Words.

Instead of a Translation of *Collumella's* Sentence, page 507, line 14, I would annex this short *English* Gloss; That which is far fetch'd, may have little Familiarity with our Soil, and may a long Time take it unkindly to be banished from its Native Place.

I dare not adventure for an exact Translation, having no other Edition but that of *Hieron. Commeline*, 1595, which is so full of Errors, that I suspect every Line. It were an excellent Work, if any Man would publish a well-corrected Copy of the four *Roman* Husbandmen, they being rare Monuments of Antiquity; the first, namely that of *Cato* the Censor, being almost 2000 Years old. Being now destitute of Libraries, if I should undertake it, having no one old Exemplar upon which I should frame my Conjecture, at the best Success, I should shew more Wit than Honesty. For I hold it a most pernicious Presumption, to intrude our own Fancies instead of such great Authorities.

Page 514. line 16. The *Latin* may be untranslated, being but a rational Inference, to authorize that which is there said in *English*.

Page

Page 515. line 10. *To the World's End.* I use these Words in a vulgar Sense. For in very Truth, and well grounded Theology, we have no Reason to conceive it to be long now, before the World shall be changed or consumed by the last Fire.

Page 515. line 28. To explain this *per Quincuncem* to the dullest, we may add these *English* Words; as in a Diaper-Napkin, or in common Glas-Windows, which is the rhombular Figure.

I dare adventure to use no more than the first Letters of some Mens Names, lest I have Blame for my good Meaning. As in this I have merited little, so I expect no better Reward; yet you have very much obliged me ever to subscribe,

Yours unfeignedly.

I. B.

To my very worthy Friend.



A N
A P P E N D I X

To the NEW
I M P R O V E M E N T S
O F
Planting and Gardening.

C O N T A I N I N G

The Culture of such Forest-Trees, Flowers, &c. as were omitted in the former Impressions; viz. The Fir, Pine, Pinastr, &c.

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Illustrated with COPPER PLATES.

By R. BRADLEY, Professor of Botany in the University of Cambridge, and F. R. S.



TO
KNOX-WARD, Esq;
Clarencieux King at Arms,
This APPENDIX
TO MY
NEW IMPROVEMENTS
OF
Planting and Gardening,
Is Dedicated,
By His Most Humble
and Obedient Servant,

R. BRADLEY.

TO
KNOX WARD, Esq;

Chairman King at Arms,

THE APPENDIX

TO MY

NEW IMPROVEMENTS

OF

Planting and Gardening,



Is illustrated,

By His Most Excellent

and Excellent Son,

R. BRADLEY.



A N

APPENDIX

To the NEW

IMPROVEMENTS

OF

Planting and Gardening.

SINCE I have written upon the Subject of Forest-Trees in my *New Improvements*, some Gentlemen have thought it necessary for me to enlarge a little upon that Head, and that I should insert the Method of propagating such Trees as are there omitted. The Timber Trees there mention'd, are, the Oak, Ash, Beech, Elm, Chesnut, and Wallnut. The Elm, indeed, according to the Forest Terms, is not a Timber-Tree, but is styled by the Foresters a Weed, and grows among the Herbage; but the Fir and Pine I omitted, by Reason of their being not so common in *England*; however, as I have since found that they will produce good Timber with

with us, and improve one of our Soils, which has been accounted barren and unfertile, I shall now give a short Account of their Culture. We are first to take Notice, that our Heath Grounds and our Rocky Grounds which yield little or no Profit at present, are extremely proper for these Plants, even tho' the first consists of the most barren Sand, and the latter has little or no Covering of Earth; and it seems to me, that all the Fir Kind will grow in any Soil or Situation.

Of the Fir, Pine, and Pinafter.

AS all these are propagated by Seeds, it will be necessary to say something of the saving of the Seeds. We must gather the Cones when we observe that they begin to change their Colour from green to brown, which commonly is about the End of *August*; for in *September* they begin to crack and shed the Seed, which, with an hot Day or two, will shed, and be lost, for the Birds are very voracious of them. When we have gather'd the Cones, we may spread them upon Mats, and expose them to the Sun, which will open them, and discharge the Seeds and Nuts; these, when they are clean'd, must be kept in a dry Place, and in *March* following must be sown upon Beds cover'd over with Nets; the Fir Seeds pretty shallow, and the Pines somewhat deeper; and the Winter following sift a little Sand over them to settle the young Roots to prevent the Frost from turning them out of the Ground. Some sow them in Boxes to let them stand two Years, and then carry the Boxes to the Place where they design to make the Plantation, which may be done in *April*, planting every one in a thin Mud made of Earth and Water.

Water. The Distances which we may plant these Trees from one another, may be about three Foot, and may so remain for four or five Years; at which Time we may transplant every other Tree at the same planting Season mention'd above, and in the same Manner. These Trees prosper extremely in the most barren Heath Ground, and even in the most unfertile Sand: They are quick Growers; so that in twenty Years they will be worth about twenty Shillings a Tree, if they are planted for Groves; or else, if they are planted singly, perhaps they will not be worth so much in thirty Years. The Sorts of Firs are, the *Scots Fir*, the *Silver Fir*, the *Norway Fir*, and the *Pitch Fir*; but the two first do best with us: And as for the *Pine* and *Pinafter*, they prosper extremely, as may be observ'd in many Places in *England*.

Of the Sycamore or Great Maple.

THE Sycamore is noted for a quick Grower, it will thrive almost in any Soil, where Trees of more Esteem will not prosper, but chiefly delights in a dry and light Earth. It is raised of Keys or Seeds sown in the Spring. As the Leaf continues on them the shortest Time of any Tree, they are not esteem'd proper for Avenues or Walk, and are apt, by a Kind of sweet Moisture, with which they abound, to harbour and propagate Caterpillers and Insects, which adds to their Inconvenience for Walks. They may be planted in Parks, because the Deer are not fond of them. The Wood being tough and light, is held little inferior to Ash, and is of great Use for making Ploughs, Carts, &c. and for all Manner of Turnery Wares. It bears Transplantation

Transplantation very well, and of any Size, chiefly in *February*. This Tree is extremely useful to make Plantations near the Sea, being a Plant which no Storm or Wind can easily hurt, but seems to prosper best when it is most expos'd to Winds; therefore Woods or Groves of this Tree should be planted to shelter our Gardens that lye near the Sea.

Of the Maple.

THE Maple will grow in any Soil, but delights most in dry Land, and flourishes more on Hills than on Plains. It is very subject to shoot out-side Branches, which fills it with Knots and Burs, and makes it very much valued by Cabinet-makers, &c. When it is free from Knots, it makes curious Boards, and is frequently chosen, by Reason of its Lightness, for Musical Instruments. It is unfit to be planted in Hedges where there are other Trees under it, by Reason of a viscus Substance which it sheds, that is pernicious to the Buds of whatever it falls upon. It is also very useful to the Turner. It is propagated by Seed sown in the Spring, like Sycamore. It may be managed the same Way as the Ash; the Seeds will not come up 'till the Year after they are sown; it will bear Transplantation at any Size: The best Time for which is the Beginning of *February*, or the latter End of *October*.

Of the Lime-Tree.

THE Lime-Tree, or Linden, is of two Sorts; the Broad-Leav'd which comes from *Flanders*, and the wild Kind, which grows naturally

in

in many Places in *England*. The first is a much quicker Grower than the other: And by reason of an ill Scent natural to the wild Lime, is much to be preferr'd; tho' this is esteem'd to yield more serviceable Wood; and of the Bark is made the Bast which is so useful to Gardeners. They may be both propagated from Seed; but as that is attended with great Trouble and Hazard, it is much the better Way to raise them from Layers or Suckers, which the Root plentifully shoots forth: And this being done about the Middle of *September*, they will soon strike Root and be fit to transplant into the Nursery in a Twelvemonth; being proper to be manag'd by the same Method as the Elm. They chiefly delight in a Sandy Loam; and I know no Soil which disagrees with them, except it be a strong Chalk, which is apt to make them Mossy. They will bear the Smoak of the Town where other Trees will not grow; and may be transplanted when they are ten or fifteen Foot high, and do very well, especially, if they have been accusom'd to be dug about in the Nursery. It is of a fine green Colour, and casts a large Shade, which renders it very convenient and ornamental for Walks: It will bear Pruning, and instantly heals upon it; and ought to be planted for Avenues at about fifteen or twenty Foot asunder. The Wood is good for making Models for Builders, and is much coveted by Ship-Carvers, being not liable to splinter, and being of a fine white Colour, and both strong and light; and the Twigs are fit for Baskets, and for every Use that the Willow is good for: And finally, the Coal is look'd upon as a better Ingredient for Gunpowder than even Alder itself. I know a Gentleman who has lined several Rooms with this Wood instead of Wainscot or

N n

Deal,

Deal, and hold very good, tho' it has been done upwards of twelve Years.

Of the Service-Tree.

THE *Service-Tree* may be raised by the Berries sown in *March*, the Pulp of the Fruit being rubb'd off to come at the Seeds; it may also be propagated by Layers, and be transplanted of any Size, from Woods where they frequently grow. It affects a rich Clay Soil, inclining to be moist, and never bears well in dry Grounds, unless it is propagated from Seeds; in which Case, almost any Earth becomes natural to it. It puts forth Leaves very early, and even buds out in the hardest Weather, which makes it a delightful Ornament for Avenues. The Wood turns to good Account for Gun-Stocks, Pullies, Spindles, Screws, and is in much Esteem by the Engravers in Wood, being of a pleasant Grain, and very durable.

Of the Horn-Beam.

THE *Horn-Beam*, of all the hard Woods, is the quickest Grower, and makes the closest Hedges, and cover'd Avenues, of any; and as its Leaves are durable, and of a beautiful Green, it is very much valued for this Use. The Wood being very white and tough, is much esteem'd by the Turner, and is very useful for Lasts, for Handles of Tools, &c. and is excellent Fuel. It is best raised from Layers or Suckers, which are always shooting from the Root; tho' it may be also propagated from Seed, which being ripe in the Month of *August*, should be sown in

in *October*. Its natural Soil is Chalk, and it seems to delight in Mountains, or will thrive in stiff, clayey, moist, barren Places in Woods, and in Parks, for the Deer will not hurt it: It affords, as has been said, an excellent Shade for Walks, and will live under the Droppings of other Trees. It may be either transplanted at 9 or 10 Years Growth for a Standard as other Trees; or, when it is about the Bigness of your Finger, may be planted for Hedges, cutting it the next Year after planting within six Inches of the Ground.

Of the Birch-Tree.

ALtho' the *Birch* is reckon'd one of the most indifferent Trees, yet its Wood is very useful for Screws, Brooms, Hoops, &c. as also for several Sorts of turn'd Wares: Its Sap makes a wholesome Wine, and 'tis good for Fuel, and makes excellent Charcoal; and some there are who suppose that its Bark is preferable to that of the Oak, for Tanning: It cannot therefore be an unprofitable Tree to plant. 'Tis propagated by Suckers, and thrives best in a dry barren Soil, where hardly any Thing else will grow; but refuses no Sort of Earth, not even that which will bear no Grass; and is a proper Plant for any rocky, sandy, or gravelly Heath, &c. which renders it more worth while to propagate, by those who are the Owners of such barren Places. I have likewise seen it do well in wet springy Ground.

Of the Poplar.

WE have two Kind of Poplars worth our Notice, *viz.* the White and the Black Poplar. They will grow on any Sort of Land, but delight most in a moist Soil. The Aspen-Tree, and the Abele delight also in moist Places, and their Method of Cultivation is the same as that of the Poplar in every respect. They are very apt to spawn or produce Suckers from the Roots, from which they may be raised. Their Roots take up a great deal of Ground, and they are therefore very detrimental to Fruit-Trees planted near them: But where a speedy Shade and Walks are desired, they are preferable to any other Trees, especially the Abele, which frequently shoots forth Branches of ten or twelve Foot long in a Year. It is a Tree that grows to no great Age, but the Wood is useful for all Sorts of white Wooden Turners Wares, and is serviceable for Building where it lyes dry; and makes very good Boards. It may be easily transplanted when large, at fifteen or twenty Foot Distance; or it may be planted out when it is small, which being kept clean weeded, the most flourishing Shoots may be pruned up for a Year or two, or longer: These will grow to great Perfection in twenty Years: And by Reason of its speedy Growth, cannot fail of being profitable to its Planter; and particularly where Fuel is scarce, great Quantities of it are planted, the Lopping whereof, which is generally done in *January*, affords good Store of Wood for that Use.

Of the Trying or Proving of Soils.

TH O' I have given an Account of Soils in my New Improvements, I think it will not be unnecessary to prescribe the Method of proving them. If we take Clay of different Kinds, and lay every Sort in so many different Pans of Water 'till they dissolve, either of themselves, or by Force, we shall find either a viscous or oily Matter swimming upon the Surface of the Water; and upon examining the earthy Parts, we shall find its Principle, Sand co-mixt with dusty Parts, as will appear by the Microscope, which will plainly discover them to be broken Parts of either Vegetables, or of such Things as have had proper Vessels for their Juices to move in, such as cannot be found in Sand, or any Kind of Stone.

It is observable in Clay Lands which lye upon a Descent, that by great Rains, some of the Parts of the Clay lying next the Surface, are frequently carry'd by Drifts into Hollows, which by a violent Dashing of the Waters, lose the viscous or oily Matter which bound the Parts together, so that when this is dry, it will become like Dust, open in its Parts; but without such Washing would become hard by drying, as all Clays, or Bodies consisting of fine Parts of Vegetables or Animals, mixt with oily or viscous Matters, will do by Infolation. This we may observe by Meal and Water, when they are mixt together in Paste, where the Parts of the Vegetables being viscous, they bind closely when the Water is put to them, and become of an extraordinary

ordinary Hardness when the Mass is thoroughly dry; and if we mix Flower or Whiting with Oil, and let such Mixtures remain till they are dry, they become hard as a Stone.

Again, if we put Oil, or any viscous Matter to Sand, which has been wash'd clean from the Vegetable or Animal Parts, we shall find that this Mass, when it is dry, may be freely broken; but if we mix such Mould with it as proceeds only from rotten Leaves, it will become of a very binding Nature, even as tough as any of that Soil which we call natural Clay.

Of the watering of Plants.

WE will here consider how Plants in general are affected by Water, and what are the visible Signs of the Want of it.

Every Plant, whether it has a bulbous, tuberous, or fibrous Root, receives its Nourishments by Means of the watry Parts in the Earth at the Extremities of its Fibres; for all Bulbs are nourish'd, as well as tuberous Roots, by the Mouths of their Fibres.

For this Reason it is necessary, when there is an Occasion for watering a Plant, that we pour the Water where we can reasonably suppose the extrem Parts of the Fibres lye; which, in large Trees, may happen to be a considerable Distance, even six or eight Foot from the Body or Stem of the Tree, or sometimes about two or three Foot, according to the Size of the Tree; but if we water such Trees, as is the common Practice, close to the Stem, the most of the Fibres are not benefited

benefited by such waterings, and the Tree still suffers; neither should we alone consider the Necessity of watering immediately, where we may judge the Mouths of the Fibres may be situated, but refresh the Ground plentifully a Foot or two beyond that Place; that the Water may not be too soon exhaled, but have Time to lye and nourish the Tree, as well by the Roots, as by continuing its humid Vapour about the Stem, Leaves, and Fruit, to nourish the more spongy Parts of them, while the Roots are gathering convenient Subsistence for their Offices.

The Signs of a Plant's want of Water are many; but it is dangerous to wait *till they appear, for our Remedy may come too late: We are acquainted with the Distress of Plants by the shrinking of the Leaves, by their turning yellow, by their flagging or hanging down, and by the dropping of the green Fruit in Trees; so that whenever any of these Tokens declare their Wants, we must not delay to give them good Waterings, as I have before-mention'd: A Day or two, if the Weather be very hot, as one may reasonably suppose it must be when this happens, is likely to occasion the Death of the Tree; or if it be a small Plant, we may be sure of its Destruction by a Day's Neglect.

We ought in this Case to consider our Soil, whether it be Sand, or Clay, or light open Ground, or strong stiff Land; if it is the former, watering of our Fruit-Trees will be necessary more frequently than in the strong holding Soil; a Fortnight or three Weeks dry Weather in Sandy Land is enough to trust a Fruit-Tree without Water, especially if it happens to be in

a warm Situation ; but if it be a stiff Soil, a Month's Drought will do it no Harm, but longer than that it will hardly do without watering ; at the same Time we should stir the Surface of the Earth we design to water, which will keep it from binding too hard, which it will be apt to do if it is tending to a Clay.

In watering of Plants we are to observe, that the Evening in the hotter Season is the most proper Time for that Operation, because that the Water will then have Time enough to mix itself with the Earth, before the too scorching Heat of the Sun can exhale it, or occasion it to scald the Roots of the Plants, which will be the Case, if we water Plants in the Heat of the Day.

I am to be understood thus far only of watering Trees, and such Plants as are growing in the natural Ground ; but the watering of Pots requires some further Consideration.

The Earth in every Pot ought to be rising a little about the Stem of the Plant, and fall gently to the Edges, that so the Water may rather fall to the Parts of the Pot among the fine Fibres of the Plant, than lye soaking about the Stem.

At every third or fourth watering of a Pot, the Surface of the Earth ought to be stirred, which otherwise would bind too hard about the Plant, and not admit the Water equally to the Root of the Plant ; or else, we may lay an Inch thick of fresh Cow-Dung upon the Surface of the Pot when the Heats begin, which will prevent the Sun's scorching of the Roots, which otherwise frequently happens.

When

When we have Trees or Plants in Pots that require a great Share of Water, they should be set in shady Places during the great Heats of the Summer, or else the Bottom of their Pots may be set about an Inch deep in Pans of Water, from whence, thro' the Holes at the Bottom of the Pots, the Plants would draw what Water they require, and so will remain in good Condition a Fortnight in the hottest Weather, without supplying the Water Pans: This is much the best Way of treating Myrtles in the Summer, as well as all other vigorous shooting Plants which are not succulent.

Of DECORS.

AS there are many Gentlemen who have a large Command of Water, especially near such Places where wild Ducks are frequent, I conceive there can be nothing more advantageous in such Places than the making of Decoys, nor, indeed, can there be any Thing more delightful.

To make a Decoy, we must chuse out a Place where we have an Opportunity of forming a large Piece of Water, from which we must make Canals branching out, either three, five, or more, according to the Magnitude of our Water, each Canal terminating in a Point, after one Angle made, all well planted about with Alders, Willows, Salles, Oziers, and such Underwood. On one Side of each of these Canals, from the Angle to the Mouth, are placed Pannels of Reed about the Height of a Man's Breast, set in the Manner of a Skreen, with
Holes

Holes for the Fowler, to peep thro', and in the Bottom of every other Pannel, is a Hole for a Dog to run in and out at; over the Canal is a Net placed in Form of an Arbor, and beyond the Angle it terminates in a Tunnel Net, wherein the Fowls are taken, as you may see in the Draught I have given of one. The Decoy being ordered in this Manner, we shall proceed to give an Account of the Method of taking the Fowl, which is thus: The Decoy-man coming down to the Angle of the Pipe or Canal, peeps thro' the Holes in the Reed Pannels, and when he sees a sufficient Quantity of wild Ducks in the Mouth of the great Pond, by whistling softly, the tame Ducks, pinion'd and brought up for that Purpose, swim into the Canal, cover'd with the Nets, to feed upon the Corn he throws over the Reeds into the Water, the wild Ducks also following to partake of the Food: In the mean Time, a Dog, taught for that Purpose, runs round the Pannels in and out at the Holes in the Bottom, which amuses the Ducks, so that they apprehend no Danger; when he has brought them far enough into the Canal, he goes stooping along the Reeds, till he has got beyond the Ducks, then rising up, shews himself over the Pannels; by which Means the wild Ducks only are frighted the opposite Way into the narrower Part of the Canal, and so they are taken in the Tunnel-Net; all this being done without any Disturbance to the rest of the wild Ducks in the great Pond. Thus the Decoy-man having dispatch'd one Canal, goes round to execute the same at all the rest; by which Means, infinite Numbers are taken every Year at one of these Places.

The

The Decoy being thus prepar'd, and planted with Alders, Willows, and such other Trees as will grow in moist and watry Places, either from Truncheons, Sets, or Twigs, it will, in about two Years, be fit for Service.; and during the two first Years, will furnish so much Cover for the wild Ducks that fly that Way, that they will begin to breed there, and entice others to the same Place, as well as Easterlings, Widgeon, and Teale. It is to be observ'd, that these Places are kept as quiet as possible, and hardly any is allow'd to speak, for fear of disturbing the Fowls; for these Kinds of wild Fowl are very timorous, and a small Disturbance will go near to make them abandon their Abode. It is remarkable, that these Decoys are generally in flat Countries, where there is hardly any Trees growing but what are in the Decoys, so that the Ducks are allur'd by the Trees as well as the Water; and in such Situations are generally caught in greater Abundance than in woody Countries. It is incredible almost to think the prodigious Numbers that are taken in a well-placed Decoy; that even one will bring in five, six, or seven hundred Pounds *per annum* to the Owner, if it be well managed, and within Reach of a good Market; and this Advantage will be pretty constant when it is once set on Foot; for when there is once a Colony rightly establish'd, they may be expected to encrease rather than diminish, for they will continually draw in more, if they are not frightned. And there is one Thing particularly to be observ'd, which is, never to let any one escape that has been taken in the Net, for he will certainly quit the Place, and take a great Number with him; which I mention, because

cause sometimes one may happen to take more than we have Occasion for ; and if once a Market happens to be overstock'd, and the Price is beaten down, it will be an hard Matter to restore it.

Explanation of Plate I.

A A shews the Body of Water.

BBB the Mouths of the Pond leading to the Canals.

CCC the Mouths of the Canals.

D the Angle of one of the Canals.

EE the Skreens or Pannels of Reed.

F the Tunnel Net, terminating at the Point of the Canal G.

H the Walks of Communication between one Canal and another.

Plate II, *A View of Part of a Decoy, with one of the Canals cover'd with Net.*

A the Net-Work over the Canal.

B the Net-Work wherein is the Tunnel.

C the Skreen of Reed to cover the Decoy-man from the Sight of the Ducks.

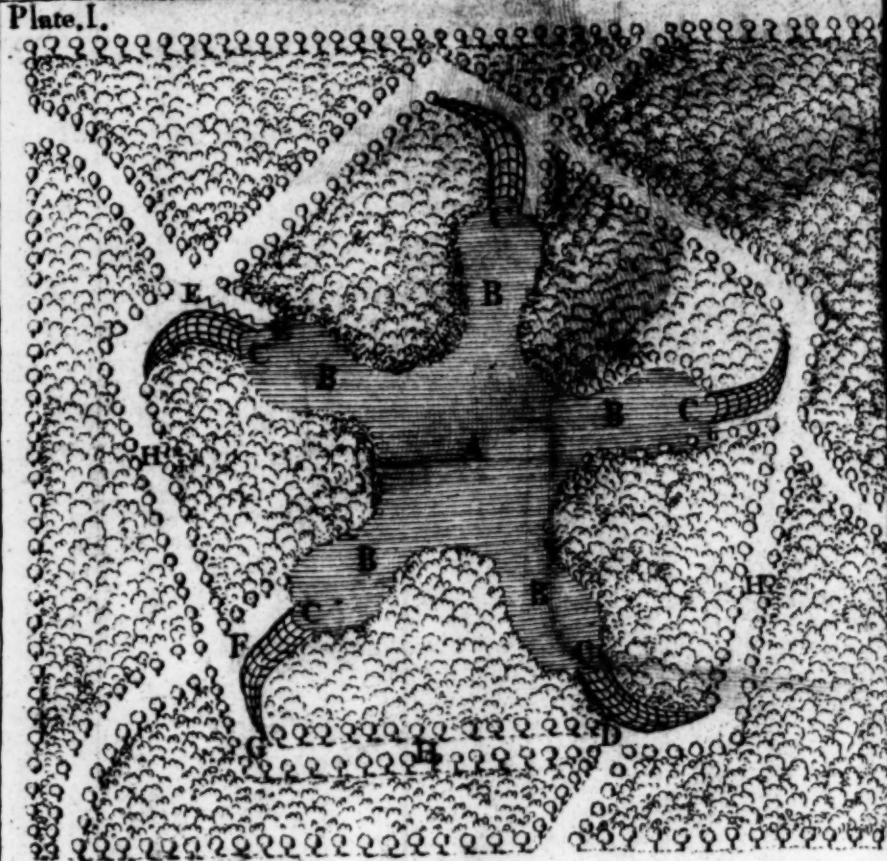
D Holes in the Skreen for the Dog to pass through,



Plate. II.

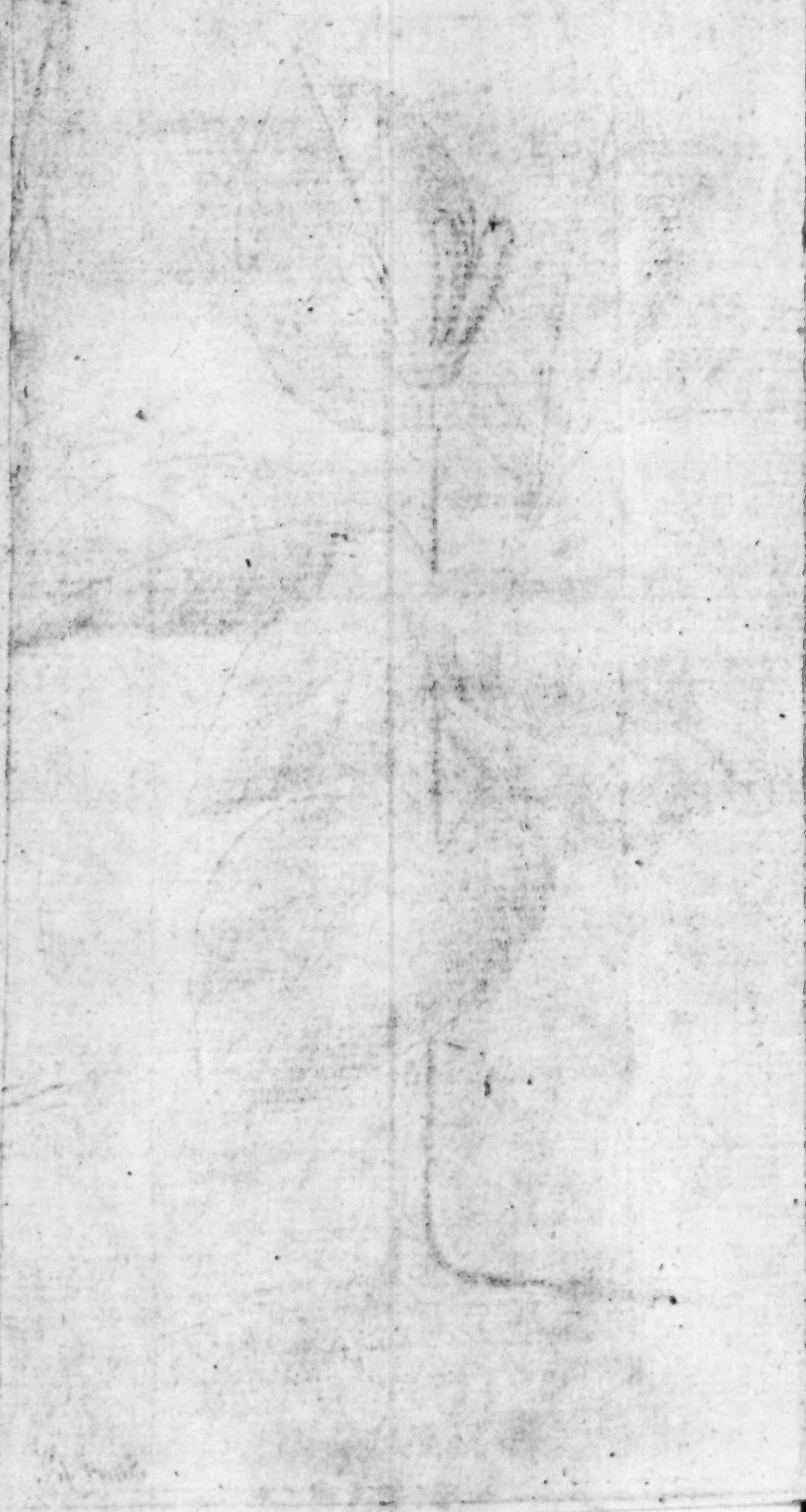


Plate. I.





Sturt sc.



Of Graffing and Inoculating, &c.

I Shall now proceed to explain the several Ways of Graffing, by which Trees are improv'd from Wildings to bring good Fruit: In order for which Design, our Garden ought to be stored with Stocks of all Sorts, that is, with such as are Pomiferous, or Apple-bearing; Pruniferous, or Plumb-bearing; Bacciferous, or Berry-bearing; Coniferous, or Cone-bearing; Nuciferous, or Nut-bearing; Glandiferous, or Mast-bearing; and Siliquiferous, or Cod-bearing; because we may sometimes meet with a strange Tree, which will only be encreased by Graffing; and as all Trees that I can now think on, are of one or other of these Classes, so our Nurseries should be provided with Stocks of these several Sorts, that we may graff the Apple-bearing upon the Apple-bearing, the Pruniferous upon the Pruniferous, and so on.

The Wilding which we are to graff upon, we call the Stock, and the Twig or Shoot which we are to graff upon the Stock, is call'd the Cion or Graff; every Cion or Graff, when it is rightly dispos'd on the Stock according to Art, will take Root in the Stock, and retain the Virtues of its Mother Plant.

Some Sort of Plants will more readily join by Eneying or Inoculating, than by Graffing; and there are others, which will not take by either of those Ways, but by Inarching only; again, there are some which will only join by Approaching: All which we shall consider in order, observing,
by

by the Way, that Nature gives us large Liberties in Graffing such, as that we may graff Apples upon Pears, or Pears upon Apples, and both these upon the Common White-thorn, upon which likewise we may graff Medlars, the Lazeroli, and Services, and upon the Graffs we may also graff the Quince; all these may be made to grow upon one Tree by Whip Graffing, or by Cleft Graffing, or Stock Graffing, or by Inoculating, Eneying, or Budding.

So the Pruniferous Fruits, such as Peaches, Nectarines, Abricots, Cherries of all Sorts, and Plumbs of all Sorts, may be Budded upon Plumbs, or upon one another; and what seems extraordinary, is, that the *Lauro-Cerasus*, which is our common Laurel and Ever-green, may be Inoculated upon the Cherry and the Plumb, and be made a Companion for all those of the Pruniferous Race: An Instance of this Sort is now in the Garden of Mr. *Whitmill*, a curious Gardener of *Hoxton*. By this we may observe, that these Graffs or Buds are so many Plants of different Kinds which grow upon one Plant; which is like one certain Sort of Soil, wherein we find growing many Plants of different Sorts; but we must observe, that one Kind will prosper better than another.

The first Sort of Graffing which I shall mention, is that Sort which we call Whip Graffing, or Rind Graffing; this is perform'd by paring off Part of the Bark on one Side of the Stock, either after we have cut off the Head of the Stock, or else while the Head remains on the Stock, for it is done both Ways; if we cut off the Head of the Stock, then the Bark we take off must leave the

the Wood bare about an Inch and half from the Place where the Head is cut off downwards towards the Root, and as wide as the Cion which we design to join with it; then we must, with our Knife, slit the Stock down from a little below the Place where the Head is cut off, guiding it with the Grain of the Wood, 'till we have made a Tongue on the Side of the Stock where the Bark is par'd off about an Inch long; this being done, we are next to pare off the Bark from one Side of the Cion, and then with our Knife make a Tongue in the Wood of the Cion, of such a Length as may fit exactly with that in the Stock, which, when we have placed together, so that the Barks of both the Cion and Stock join, we must tye them fast with Bafs, and cover all the wounded Part with fine Loam well mixt with Cow Dung; or else we may cover the wounded Part with the following Mixture, *viz.* To four Ounces of Bees-Wax add as much Tallow, and when these are melted together, add about an Ounce and half of Rosin; which must be used, when 'tis Blood warm, with a soft Brush; and then we need not tye the Cion and the Stock together, for these Coverings are only design'd to keep the Air and the Wet from the wounded Parts till they are united, which they will soon be, if the Tongues of the Stock and the Cion are well wedg'd into one another: When we use this Sort of Graffing without the cutting off the Head of the Stock, we then take the Bark from the Stock in any smooth Part of a Shoot, *i. e.* between the Buds, and fitting the Cion to it as before with Tongues, we then cover the wounded Parts with some of the afore-mention'd Graffing Wax. This last Operation may be done when the Sap is in its highest Fluencies; but the first

first must be done just before the Buds begin to shoot.

Cleft Graffing, or Stock Graffing, is perform'd by cutting off the Head of the Stock, and then with the Knife flitting the Stock downwards an Inch or two, in Proportion to the Bigness of it and of the Cion we are to put into it; we then cut the Bottom Part of the Cion Wedge-wise, of the same Length we have made the Slit, and so place the Cion in the Opening we have made in the Stock, that the Bark of the Stock and the Cion both join or match with one another.

If the Stock happens to be very large, as sometimes it is when we use this Kind of Graffing, such as an old Tree saw'd off, which may, perhaps, measure three Foot in the Girt; then we must be forc'd to open the Places where we are to fix our Graffs, with Chissels, and keep them so open with Wedges 'till the Graffs are fixt to our Mind: In such Stocks we may place three or four Graffs, but two are enough, if we could be sure they would all take; in this Case our Cions may be larger than if the Stocks were small. In *Worcestershire* it is common enough to graff Apples this Way, with Cions which measure about five Inches in the Girt, and they prosper very well; but we must observe, that our Cions may be larger if they are of Trees that have tender Wood, than if they are of a hard Wood. When this is done, lay on some of the Graffing Wax as before directed, so as to cover all the wounded Parts of the Stock and Cion. In this Case, where the Stock is large, there is vegetable Matter enough in it to feed the Cions to good Advantage, so that the third Year they will produce extraordinary

dinary large Fruit, tho' before the old Head was cut from it, the Fruit was hardly bigger than Hazel Nuts. Here is another Example of a Tree's growing upon a Tree; and as the Cleft-Grafting is practicable upon the oldest Trees, so it is to be done upon Plants which are not above three Months old from the Seed. This I learn'd from Mr. Curtis of Putney, a very curious Gentleman in the Knowledge of Plants: His Method is, when he raises Orange Trees from Seeds, that as soon as he finds they have got a Stalk about three Quarters of an Inch above the Ear-leaves, he cuts off the Top, and making an Incision cross that Stalk, bears his Knife downwards towards the Part where the Ear-leaves join with it; and then chusing a tender Shoot of a bearing Tree that will match with the Stock, he cuts the Bottom of it in the Manner of a Wedge, and places it as I have related before, so that the Barks may join; and then applies some of the Grafting Wax warm with a fine Painting Brush. This Operation may be done all the Summer long, and is particularly explain'd in my *Philosophical Account of the Works of Nature*.

I am next to speak of Inarching, that is, inlaying the young Shoots of one Tree into another, which is the surest Way of Grafting that I have yet mentioned; for here, if the Part which acts as a Cion, does not happen to join with the Stock, it may still remain upon the Tree. To perform this Work, one must have a Collection of Stocks in Pots, that when we have any particular Tree which we have a Mind to increase, we may bring the Stock to it; and then cutting off the Head of the Stock, we chuse out such a Shoot of the valuable Tree, as may with the

most Ease be brought down to the Stock ; and then we must order both of these with Tongues, as I have directed in the Whip Graffing, only we must leave that Part which is to act as a Cion, to join with the Tree in such a Manner, that it may be well fed with the Juices of the Tree : I commonly, in these Cases, cut the Tongue of the Graff half-Way only thro' the Shoot. This being thus order'd, we are to tye our two joining Parts very close, and then cover them with the Mixture of Loam, and Cow-Dung ; also taking especial Care to secure the inlaid Branch from flying from the Stock, which sometimes it will be apt to do, if it is not well secur'd by Strings or Sticks ; for tho' this is a Work to be done in the Summer, when the Plants have their Sap in the greatest Fluency, yet the mildest Summer is not without its Storms, especially in *June* or *July*. It is to be noted, that some Plants should remain thus join'd till the second Year, before we cut them from the Bearing, or the desir'd Plant ; especially those, whose inarch'd Shoots are of a more hardy or woody Nature ; but where we can inarch green Shoots, such as those of Oranges or Lemons, if we do this Work in *May*, we may cut them off in *August*, if we find they have taken hold of the Stocks.

When we have cut our Plants from the Mother Tree, we must set them immediately in some Place of Shelter, where the Winds may not get at them, for else the new Heads which are tenderly join'd, will be subject to break from the Stocks ; or if the Stock be growing in the natural Ground, then, when we cut the young Inarch from the Tree, we must be careful to guard them well with Stakes.

Inoculation

Inoculation is the next Improvement I shall treat of. To inoculate, is the same as to eney, or to bud; and is nearly the same as the Ancients call'd Emplastration; only their Emplastration was cutting out a large Piece of the smooth Bark of a Tree with several Buds upon it, and then opening the Bark of another Tree in such Manner, as to lay the Bark of the bearing Tree close to the Wood of the Stock; they then cover'd the wounded Parts over with a Kind of Mortar, or prepar'd Loam: This Method is safer and surer in the Way of Inoculation than our Inoculating with a single Bud, because the great Quantity of Bark taken off with the Buds, which may be about two Inches square, must hold a good Fund of Nourishment, to support the Buds 'till they have join'd with the Stock; but, however, our common Way of Inoculating with a single Bud, is not inferior to most of the modern Ways of Graffing, provided we take Care to be guided by the Vigour of the Sap; I mean, that we never attempt to bud or inoculate any Tree, but when the Bark will rise freely from the Wood, as the Gardeners say; or, in other Terms, will slip from the Wood.

Our Buds, in this Case, must be such as can be taken from the last perfect Shoot of a Tree, and of the Bark, in which this Bud happens, to be plac'd about half an Inch below the Bud, and as much above it, and on each Side the Bud about half an Inch; then making the Incision in the Bark of our Stock, like the Figure T, we raise that Bark on both Sides from the Wood, and then stripping the Bud from the woody Parts which join to it, insert it between the Bark and

the Wood of the Stock, and tye it with Bafs, fo that the Bud may not be hurt or cover'd; or elfe fome of the Graffing Wax being apply'd, as directed in the former Graffings, will be fufficient without tying.

I have now only to describe the Method of Approaching, or Graffing by Approach, which fome have falſely taken for Inarching: The Ancients, in moſt of their Works, recommend it as the ſureſt Way, and I have had Experience enough to find it as they ſay: I have mention'd it in my Monthly Writings; but I know no Gardener that has it in Practice at preſent but Mr. *Whitmill* of *Hoxton*. It is perform'd in young Shoots while the Sap is fluent, or in Shoots of the laſt Growth when the Sap is beginning to flow vigorously; we then place two Plants together, and paring off the Bark from one Side of a Branch of each of them, we apply the wounded Parts to one another, and tye them together with Baſs; and if they are tender ſhooting Plants, they will ſoon unite in their Woods, and may be cut off in three, or four Months; and when Plants are very different in their Nature, as the *Fig* and the *Mulberry*, or the *Vine* and the *Paſſion-Tree*; we may reconcile them by this Means, as may be obſerv'd in the Garden above-mention'd. As for the Method uſed by the Ancients of Terebration or Boring of Trees, it was no more than piercing thro' the Bark, and then preſſing the Inſtrument downwards between the Wood and the Bark, they made Room enough to receive the Foot of the Cion two or three Inches, by which Way the Cion was fed, and ſtruck Root in the Tree; but the Foot or Bottom Part of the Cion muſt be
prun'd

prun'd a little, so as to make it terminate in a Point, and when it is fix'd, we must close the Orifice with Graffing Wax. This is now out of Practice among the Gardeners, but I find it of good Use, especially in difficult Cases: The Time I have try'd it with Success, was when the Bark would slip easily.

See the Plate VI, for the several Manners of Graffing.

Of the Situation of the Kitchen-Garden.

I Come now to speak of the Manner of disposing of a Kitchen-Garden to the best Advantage.

A Kitchen-Garden ought chiefly to be the Place where we cultivate our choicest Fruits, as well as Herbs and Roots, for the Use of the Table. It should, if possible, be wall'd about, for the Sake of the tender Fruits which we ought to cultivate there, as well as for Security. This Garden ought particularly to be well expos'd to the Rising Sun and the South Sun, to give the Contents of it the greater Perfection, and bring them to a due Maturity. Here we ought also to have the Command of Water; and there should be an easy Connexion between this and the Stable-Yard, for the more easy bringing the Dung, or other Manures, and carrying out of Weeds, or other Incumbrances. The best Way for such a Garden to be dispos'd, is to lay it in large square Quarters, and to fence in such Quarters with Espaliers of Fruit-Trees, such as Pears, or Vines of the earliest Ripe Grapes, or Abricots,

or Plumbs; but these Fruits should not be mixt in one Walk; but let all the Pears be together, for the Sake of making the Walk all of one Face, and so the others in the same Manner. The Walks where I propose the Hedges or Espaliers of Fruit, are those which should be the principal Walks for Pleasure; and when we have Fruit to protect them, we shall find no Loss in allowing such a Distance between the Hedges, as may prevent one Hedge from over-shadowing the other; the Fruit of Hedges will sufficiently pay the Loss of Ground in these Walks: And these are necessary to keep a Correspondence between one Quarter and another, besides the Pleasure of them to walk in, for a Walk lin'd with Fruit is none of the most unpleasant Sight. Particularly we should contrive an easy Correspondence between one Part of our Garden and another; for when the Passages of Communication are not easy, a Gardener may lose half his Time in going from one Place to another about his Business, which is so much Loss to the Master. For the same Reason, we should always contrive our Quarters for Hot-beds near the Stable-Yard, or such Place where the Litter for Hot-beds may be brought in Carts; for if this Spot happens to lye remote from such Places, the Dung must be brought a long Way in Barrows, to the Spoiling of the Walks, and the extraordinary Expence of the Mens Time. The Place where these Hot-beds ought to be, should be fenced in well with Reeds, and be kept under Lock and Key by the Gardener, that none should have the Opportunity of looking into the Hot-beds but himself; for the lifting up a single Glass for half a Minute or less, at an improper Season, will destroy his whole tender Crop; and besides, he will then
have

have no Body to blame but himself if any Mis-
chance happens. In this Place should be a Frame
for ripening Fruits artificially, if such a Thing
is desir'd; and also a Tool-house, and a proper
Place for drying of Seeds and Herbs, and pre-
serving of Fruit; with Conveniencies, if possible,
for the Gardener to reside, that he may always
be ready to survey his more curious Works, and
be in the Way to defend his Treasure of Fruit
from Robbers, which should be constantly un-
der his Care, if he be an understanding Man,
that every Sort may be brought to Table in its
proper Season; and not, as it too frequently
happens, to send a fine eating Fruit to the Oven,
because they are lodg'd in such Hands where they
are not understood, and often occasions either a
Reflection to be cast upon the Nursery-Man who
provided the Trees, or on the Gardener's Con-
duct; for my own Part, I find it the best Way
to have the Name of every Sort of Fruit that is
planted in a Garden, written at length upon a
Board placed over the Tree, that every one may
see it. This Method will save the Loss of a
great deal of Fruit in a Garden much frequented;
in which Case it is too frequently practis'd to ga-
ther harsh unripe Fruit, and, after the first Taste,
to fling it away; and then in the first Company
to decry the Fruit of the whole Garden; tho',
perhaps, it possesses the best Collection in the
World.

Of the Truffle, and its Culture.

SINCE I have found that my Observations concerning the Raising of Mushrooms have been so well receiv'd, that there is now hardly a Garden of any Note near *London* without them, or where there has not been Attempts made to produce them in every Month of the Year, I am persuaded, that the following Account of the Vegetation of Truffles, and of the Method of their Culture, will prove altogether as acceptable. I am told, indeed, 'tis much too great a Secret to divulge, and that to keep it in my own Hands, might be of the greatest Consequence to me in my Fortune, considering, that every Pound of Truffles, fresh gather'd, is sold for a Guinea; but however that might be, I am pettrly well persuaded, that I shall merit more Esteem by making it familiar to the Publick, and shall rest myself contented with the Pleasure of doing something which may contribute to the Pleasure of my Countrymen; and, besides, by making the Truffle more common, it will become cheaper, and our Tastes may be satisfy'd at less Expence. But to proceed: Let us first consider, whether the Truffle be a real Plant or not. Monsieur *Geoffroy*, of the Royal Academy of *Paris*, in one of his Lectures, says, That all Bodies which seem to vegetate, may be generally put into two Classes: The first, to consist of those which possess every Character belonging to a Plant; and the other, to be made up of those which seem less perfect, and are suppos'd to want some Part or other which one ought to expect in a Plant. Among the latter, some are seemingly

seemingly without Flowers, as the Fig-Tree; which, however, some believe carries its Flowers within the Fruit. Others are seemingly without either Flowers or Seeds; as the most Part of the Marine Plants; for tho' there are discover'd something like Seeds lying in particular Cells of many of the Sea Plants, yet it is a Doubt whether they are really Seeds or not. Again, there are others which are composed of Leaves without Stalks, or other apparent Parts belonging to a Plant, as the *Lactuca Marina*, or Sea Lettuce, which is often found growing upon Oyster Shells. Others have Stems or Stalks without Leaves, as the Euphorbium, Corals, and the Lythophyton, and most of the Stony Plants. Others again, one may say, carry no Face of a Plant, because one cannot distinguish in them either Leaves, Flowers, or Seed. Of this Gender are the most Parts of the Mushrooms, Sponges, and Morilles; but above all the Truffles, which even seem to be without Roots. The Botanists, however, range them among Plants, because they have a Mode of Growth, and Power of increasing, not doubting but they likewise contain the essential Parts of Plants, tho' they have not the apparent Parts. As it is in Insects, which have the essential Parts of an Animal, tho' the apparent Structure is different: But the Truffle is of that singular Structure, that it well deserves our most careful Examination.

This Sort of Plant is a Kind of fleshy Tubercle, cover'd with an hard shagreen'd Coat, knotted or bunch'd on its Superfices somewhat regularly, resembling very much the Cone or Nut of the Cypress Tree, which is commonly call'd in *England* the Cypress Apple. It is remarkable,

markable, that the Truffle seldom appears above the Ground, but, for the most Part, lyes about half a Foot under the Surface of the Earth, and sometimes not so deep. We always find several together in the same Place of different Sizes, and, now and then, one that will weigh upwards of a Pound; but these very large ones are somewhat rare. We are certain, however, that there are very large ones, and even in *England*, at the Seat that was the Lord *Cullin's* in *Northamptonshire*, Mr. *Benj. Townshend*, who was his Lordship's Gardener, tells me, he has gather'd one that has weigh'd about 11 Ounces. I have found them in several Places in *England*; and, I conceive, there is hardly a Country which is not capable of producing them. In *Pliny's* Time, those were accounted the best that were brought from *Africa*; and at present there are good ones found in *Brandenburgh*, and other Parts of *Germany*. They are very common in *Italy*, in *Provence*, in *Dauphine*, in *Languedoc*, and in the *Angoumois* and the *Perigot*: They are also pretty frequent in *Burgundy*, and about *Paris*. The Soil where they are most commonly found, is a reddish sandy Loam, where we may chiefly expect them, if such Land has lain a long Time uncultivated: They are found chiefly under the Shade of Trees, and even among their Roots, and among Stones, and sometimes, tho' very rarely, in plain open Ground. Their favourite Tree is the Oak, or the Ilex or evergreen Oak, as the Elm is the Favourite of the Morille.

We begin to discover Truffles in the first mild Weather after the Frosts are over, be it sooner or later, as the Season is warm or temperate, and
even

even in open Winters they are to be met with here and there.

In the Beginning of their Growth they appear round, like small Peas, reddish on the Outside, and white within; these grow gently to Perfection, and attain to a greater Bigness as the Soil is agreeable to them. Early in the Spring we begin to find those which are call'd White Truffles, which are, indeed, insipid of themselves; but are generally dry'd to be used in high Sauces, because they keep better dry than those that are Marbled. It is the common Opinion, that a Truffle once displaced, will never grow or receive any Nourishment afterwards; tho' we put it again in the same Place from whence we remov'd it; but if we let them grow to a certain State without displacing them, then they will insensibly grow bigger, and their Coat or Covering will become black, and shagreen'd or unequal, tho' they still retain their Whiteness within. To this Point of Ripeness they have very little Smell or Flavour; for which Reason they are not yet fit for any thing more than to put in Sauces; and these are of that Sort which are call'd Abroad, the first white Truffles, but ought not to distinguish as a different Kind from the marbled, or the black Truffles, which are gather'd from the End of Summer till the Severity of the Winter, because they are no more of the same Sort, only in different Degrees of Ripeness. We shall consider the white Truffle in the first State, as if it were a Plant, that contains at the same Time the Root, Stalk, and Fruit, which, by insensible Swellings, open and dilate the Parenchima, or outward Coat. As the Truffle swells, so the Coat or Covering hardens and chaps in several Places,

Places, to give the better Room for the spreading or explaining of the Mass contain'd within it, or, perhaps, for the better furnishing that Mass with Nourishment: Then the Truffle begins to change Colour, and from its white State begins to be marbled with grey, leaving only so much white as seems to denote a Continuity of Vessels which lead to the Heart or Centre of the Truffle.

The grey Marblings in the Truffle being view'd with a Microscope, seem to be a transparent Parenchima, compos'd of very fine Vessels. In the Middle of this Parenchima are discover'd black round Spots, separated from one another, which are seemingly Seeds that discolour the Parenchymous Part where they lye, while the Parts where they are not found, remain white; which white Parts may be look'd upon as Channels or Sap Vessels, because they always terminate in the Coat or Covering.

When the Truffles are come to this Degree of Perfection, they have a most excellent high Taste and Flavour; and it is observable, that the Heat and the Showers of *August* contribute greatly to their Ripening, which perhaps might give Room for some Authors to imagine they were the Off-spring of Thunder; and it is a Rule Abroad, that the very best Truffles are not discover'd 'till the Beginning of *October*, and from that Time 'till about the End of *December*, and, in mild Winters, even 'till *February*; during which Harvest (if I may so say) of the Truffles, they are marbled, whereas those which we gather between the Months of *April* and *July*, or *August*, are white in their Flesh. It is
to

to be observ'd, that if we do not happen to gather the Truffles just when they are at their full Point of Ripeness, they presently rot; and it is then we may remark the Re-production of them, for in a short Space after that, we may find several Heaps of little Truffles supplying the Places of the rotted Truffles: These young ones feed and grow 'till the first cold Weather; and then, if the Frosts are not too violent, they hold the Winter, and come to be what are call'd white Truffles early in the Spring.

Monfieur *Geoffroy* tells us, that the great Frost in 1709 either destroy'd, or kept back the Growth of the young Truffles, for that there were not any found 'till the Autumn following; but that the Year after, they were in great Plenty at the common Seasons. It has not yet been discover'd that they have any Root, or the least Fibre, to take hold of the Ground, but they are so tightly inclos'd by the Earth, that they imprint the Figure of their Coat in it; they are subject, like most Roots, to be attack'd by Insects; the Worm which frequently eats into the Truffle is white, and very small and thin, and is different from those which we find in the putrify'd Truffles; the little white Worm I speak of, when it has eat its Way into the Truffle, lays itself up in a Chrysalis cover'd with a delicate wrought Nest or Bag of white Silk, and afterwards changes into a blue Fly, which escapes from its Nest thro' the Cracks which are observable in the Truffle Beds: So that where we see this Sort of Fly, we may look upon it as a certain Sign of Truffles growing in the same Place.

When

When we happen to dress a Worm-eaten Truffle, it discovers itself in being bitter to the Taste, and, upon Examination, one may discover the Part which is wounded by the Insect to be blacker than the rest of the Truffle, and that it is only the wounded Part which is bitter, while the other Part of the Truffle preserves its fine Flavour. And if we open one of the worm-eaten Truffles, when it is raw at the wounded Place, we may easily discover the Nest of the Insect, with a Space about it without any Marbling, and of a different Colour from the rest of the Truffle, somewhat tending to the Colour of rotten Wood. In observing the white Specks upon the Superficies of the Truffle with a Microscope, one may discover them to be small Insects which feed upon it; tracing along the Channels in the Bark, these Insects are white and transparent, of a roundish Figure, somewhat like Cheese Mites. This Insect has only four Legs and a very small Head, in Proportion to the Bigness of its Body, and is pretty nimble. These are sometimes found in the abandon'd Cells of the Flies, and then change from their Whiteness and Transparency to a Coffee Colour.

It is to be observ'd, that no Herb or Plant is ever seen to grow upon a Trufflery, or Truffle-Bed, which, perhaps, may either be because the Truffles rob the Ground of all vegetable Nourishment; or else, as some imagine, it may happen from the Scent of the Truffles, which will not suffer Plants to live near them; I mean such Plants as are of the Under Race, which draw their Nourishment chiefly from three or four Inches Depth of Earth, but Trees draw their
Nourish-

Nourishment several Foot deep, and so cannot be injur'd by the Truffle, if the first Conjecture be right; but if it be from the latter, as some are of Opinion, because the very Earth where Truffles grow, has a strong Scent of Truffles in it; it may be, that that Scent is poysonous to Plants of the inferior Class. In *France*, the Country People, by Observations of this Kind, are so expert in the Discovery of the Trufferies, that they are seldom disappointed. They know the Extent of a Truffle-Bed, by observing that no Herb grows upon it, or that the Earth is superficially void of Plants, and in the next Place, by the Cracking or Chapping of the Ground, by the Degree of Tenacity which it has, and by the blue Flies which are already mention'd; as also by a Kind of long black Fly, which is engender'd at the rotting of the Truffles. This last Kind of Fly is very different, as well in Colour as in Shape, from the other Sort, and somewhat resembling those Flies which we generally find about putrify'd Bodies.

The *French* and *Italian* Peasants are very artful in gathering the Truffles without cutting them, especially if they are large; on this Occasion, the best Instrument I have seen is a Stick like a Dibble, where the Point is not too sharp, or pointed; this Instrument being generally blunt and smooth on the Sides, there will be little Danger of breaking the Truffles, because, upon opening the Surface of the Earth, the lower Parts will give Way, and the Truffles, by that Means, be turn'd up whole and entire; but then, if by disturbing the Earth, and removing the Truffles from their first Place, they will not grow again, we may suppose all the young ones will

will be destroy'd, perhaps for the Sake of one Truffle that we take up; but we are certain of the contrary, because of the long lasting of a Trufflery, which, tho' frequently disturb'd by the Gathering of the Truffles, yet continues to bring fresh Parcels every Year. I have already taken Notice in my *New Improvements* of the Manner of hunting for Truffles with an Hog in a String, which Method is often us'd Abroad, as well as searching for them with a Dog that has been train'd to the Sport; but I shall speak of the Method of teaching the Dog in another Place.

Mr. *Townsbend*, whom I have before mention'd, tells me, that at my Lord *Cullen's* in *Northamptonshire*, beside the Woods and Places under Hedges, where he us'd to find the Truffles, they were also found in a Grove; but that the Trees in that Grove happen'd to be cut down, and they were no more discover'd in that Place, for they do not prosper when the Trufflery comes to be expos'd to a full Sun; for the Truffle, like other spongy Bodies, being expos'd to the Sun, will shrink and dry up, when on the other Hand, a moist Air will make them swell. But it is not only at my Lord *Cullen's* in *Northamptonshire* where the Truffles are found; they are frequent in most of our Woods, but have been over-look'd: The Hogs, indeed, fare the better for them, at the Time when they are turn'd out to feed upon Acorns, and the Mast of other Trees. I have found them in *Leicestershire*, in some Woods by *Wetherby* in *Yorkshire*, and in *Hampshire*, likewise in a Coppice and Wood by the Place call'd *Wormwood-Common* by *Acton*, as also on *Epping-Forest* in *Essex*; and I am credibly inform'd

inform'd, that there were some found in his Royal Highness's Park at *Richmond*; but what was remarkable in them is, that Dr. *Sagerdhal*, his Majesty's Physician, told me, they had something of the Scent of Garlick; but, indeed, considering how much the Ground thereabouts is over-run with what is call'd Crow Garlick, I do not much wonder at it, for where this Kind of Garlick grows, one may, in a very hot Day, even distinguish the Scent of it in the Air, as I have found frequently: And it is no Wonder, if a Body so spongy as the Truffle, should imbibe from the Earth near which the Garlick grows, some Share of the Garlick Flavour. These last Truffles, I am inform'd, were discover'd by a Dog that had been train'd for the Sport.

I come, in the next Place, to enquire, whether there be more than one Sort of Truffle. Mr. *Tournefort* admits only of two Kinds, which he distinguishes by their Figure, the first is round, which he gives us a Cut of in his Elements of Botany, and is the same which *Matthiolus* and most of the other Botanical Writers, have mention'd: It is this Sort which I have been speaking of. The second Sort is that which *Mentzelius* calls *Tubera subterranea testicularum forma*, in his *Pugillus rariorum plantarum*. This Truffle differs from the other in its Figure, and in the Colour of its Flesh, which, according to that Author, is reddish, here and there interspers'd with green; but perhaps this Kind, if it had been examin'd at different Seasons, might have been of different Colours as well as the first Sort, which, in several Seasons, is of several Colours. *Mentzelius* discover'd this Kind in the Months of *August* and *September*, which is the Time when

Truffles are unripe. Upon this Foot we have but two Sorts which differ in their exterior Make; for we should not suppose, that the Difference in Colour only in the fleshy Parts, is sufficient to make Variety of Kinds, since what I have said, shews us, that a Truffle at different Seasons will be of different Colours; neither ought the different Sizes of Truffles to pass for Characters sufficient to make them of different Species, because they may in the Time of their Growth be obstructed in their Enlargement by Roots or Stones, or otherwise, or in some Soils may grow much larger than in others.

Pliny tells us, that in the Island of *Lesbos*, at a Place call'd *Metelinum*, there were good Truffles; but that they were only found there after the overflowing of the Rivers, which he imagin'd brought the Seeds of them from a Town in *Asia*, call'd *Tiares*, where the Truffle used to be found in great Abundance; but as the Overflux of the Rivers in many Places are almost constant in Point of Time, as that of the River *Nile*, it might be that Truffles were about such Times in their full Perfection, and were not otherwise known to the People but when they were ripe, or else the Overflux of the Rivers might, by moistening the Ground, occasion the young Off-spring to swell, which otherwise, for want of Moisture, might perhaps have never stirr'd or encreas'd in Bigness: But I do not make this Observation to insinuate that Truffles have no Seed, for I am of a contrary Opinion; for in the forgoing Observations, it seems reasonable to suppose they have Seeds, or else from the rotten Truffles, which I have mention'd, there could not come such Numbers of young ones as are to be observ'd in every Trufflery.

Trufflery. This Reproduction is a Confirmation that there are Seeds in a Truffle which are inclosed in the fleshy Part, as above related; but that it is only in those Truffles which are perfectly ripe and near Rottenness, that we ought to expect them fit for Action. Again, one may observe here, as I have done in other Cases which I have mention'd, concerning the Vegetation of Seeds, that they are greatly help'd in their Growth, if they are put in the Earth with their Pulp about them; which Advantage the Truffle has constantly. What we suppose to be the Seed of the Truffle, is already related, *i. e.* the little black Specks which are observ'd in the greyish Part of the Marbling; but these Seeds are not remarkable before the Truffle is ripe, and then, like ripe Fruits, it emits an agreeable Odour; and remaining for a little while in the State of Perfection, it tends to Rottenness, which occasions the Seeds in it to grow. It is observable, that when many ripe Truffles together are inclos'd in a Vessel well stopp'd, they will ferment to such a Degree, as to yield a Scent almost like Musk, and then they soon begin to turn mouldy and viscous. In the Gathering of Truffles for keeping, it ought to be done in dry Weather, and then every Truffle should be kept single, as one would keep our choicest Fruit: And it has likewise been practis'd with good Success to put them in Oil; by which Means they will remain good a long Time, for the Oil stops the Pores in the exterior Parts, and prevents the Fermentation. We may find these preserv'd in Oil at the Oil Shops, and they are little inferior to the fresh ones when they are stew'd; but the dry'd Sort, which I mention'd before, being made of the unripe Truffles, have no Flavour but what is given them by the Sauces, and in my

Opinion, are not worth the Trouble of Dressing, notwithstanding they are sold for Twenty, and sometimes for thirty Shillings *per* Pound; but I suppose shortly the fresh Truffles will be so well known in *England*, that the dry ones will be esteem'd of little Worth. The Country People in *France* pretend, that the Truffle is much better after the first short Frosts, than before them, which is reasonable enough, considering the Cold puts a Stop to their high Fermentation; for it is to be remark'd, that when the Fermentation is very high, it rather affords the musky Flavour, than such an one as would invite us to eat; and besides, as such Fermentation is suppress'd by the Cold, the Truffles will keep longer. Those who preserve them, either keep them in Sand or in Earth, according as they want more or less Moisture. If they want Moisture they will shrink, and then the Earth is best for them; but if they keep themselves full and plump, then Sand is the best.

But I come now to lay down such Rules as are necessary to be observ'd in the Culture of the Truffle, which may be very easily done, where there are Woods or Coppices of Oak or Hazle, and where the Soil is not too stiff, or inclining to Chalk. It may be remember'd, that I have mention'd the Sort of Earth which is commonly found in the Trufflery, and there is no doubt but that Sort will be always the best for our Design, if we can have it, especially if it has lain long uncultivated. When we are thus provided of the proper Soil, we must be sure to let it lye undisturb'd till we are ready to plant, which will be in the Months of *October*, *November*, and *December*, if the Weather be open, for then the

Truffles

Truffles are to be found in their full Ripeness and then likewise one may find them in a State of Putrification, which is the Time when the Seeds are prepar'd for Vegetation; 'tis in this last State that one ought to gather Truffles for planting, or at least they should be in perfect Ripeness. It has been prov'd, that a ripe Truffle has been kept in Water six Months before it rotted, and the outward Coat or Skin was then in a good and sound State, I mention this, because it will be no bad Instance to prove the Method I recommend to be good.

The proper Soil, and these rotten Truffles, being found, we may begin our Work as follows: Open a Spot of Ground of a convenient Space, and take out the Earth about eight Inches deep, and skreen it, that it may be as fine as possible; then lay about two or three Inches thick of this fine Earth at the Bottom of the Trench or open Ground, and upon it lay some of the over-ripe Truffles about a Foot and a half Distance from one another; and, as soon as possible, prepare a thin Mud, made of the skreen'd Earth and Water well stirr'd and mixt together, and pour it on the Truffles till the open'd Ground is quite fill'd up; by this Means, in a few Hours, the Ground will be as close settled about the Truffles, as if it had never been dug or disturb'd at all, and you may expect a good Crop in due Time, you must, however, take Care to chuse your Spots of Ground in Woods or Coppices, or such Places as are shaded with Trees. At a Seat of his Grace the Duke of Mountague in *Northamptonshire*, called *Newton*, the Truffle has been found in a *Philberd Walk*, where the *Philberds* met at the Top, and the Ground below was mossy; and at *Rushton* in *Nor-*

thamptonshire under Hornbeam Hedges. Again, we must take Care in the Removal of our Truffles, to put them in Sand as soon as we take them up, and so keep them 'till we replant them. These, contrary to Mushrooms, are not apt to suffer by much wet, but thrive the better for it, while Inundation, or very wet Weather, rots the Mushrooms. Before I conclude this Account of the Truffle, it will be necessary that I remark, that when I mention'd it in my Chapter of Mushrooms in my New Improvements, I was in doubt whether it was a Plant or not, but since I wrote that Piece, I have had Experience enough of it to know that it is truly a Plant, and that it is produc'd by Seeds, as I have hinted above.

Of the Morille or Morill.

I Shall now proceed to speak of the Morille, and offer some Directions for its Culture. We must know, in the first Place, that the Morille grows above Ground, after the Manner of Mushrooms, but with this Difference, that its Cap or Head never opens, but is much wrinkled, and of a pretty hard Substance.

The Morille appears in *April*, many together, and is an Inhabitant of Woods and Groves, and among Hedges, and I look upon them to be Tokens of a Trufflery near at Hand; for I have not yet met with the Morille growing any where, but Truffles might be found growing near the same Place, if they were sought after. I remember to have seen the Morille growing in a Spinny, or little Wood, in the Park of *Steane* near *Brackley* in *Northamptonshire*, formerly a
Seat

Seat of the Lord Crew's, Bishop of *Durham*, and now in the Possession of his Grace the Duke of *Kent*, and I am fully persuaded there are Truffles in the same Wood; for I observ'd, at the same Time, large bare Spots of Ground in several Parts among the Trees, which signify so many Trufferies, according to what I have before related; but tho' I had not then an Opportunity of examining them, I am persuaded they may yet be found there if they are sought for.

But to return to the *Morille* or *Morill*, as it is commonly call'd in *England*: It has been found growing in the Woods and Groves at *Rushton*, which I have mention'd before, in *Northamptonshire*; and I am apt to think, that they might be found also at *Newton*, if they were sought for, and, I suppose, likewise at the Lord *Hatton's* in the same County, where, I am inform'd, there have been Truffles found; the *Morille* is also very commonly brought to *New-market* about the Spring Horse Races. This has about its Roots or Bottoms, such white Strings as are found about the Roots of Mushrooms, branching themselves in the Earth, which is well clos'd about them: This Earth, which may be gathered where we find the *Morille*, may be remov'd in Lumps from one Place to another; but there must be Care taken to set it in such a Part of a Wood or Grove, as that was where it was taken from, and that we bury it as deep as it was before, at the same Time pressing the Earth about them, and giving the new planted Ground as much Water as it will receive, even so as to wash it into a Mud, if possible: And thus let your new Plantation remain till the Spring following,

at which Time you may expect to see the Produce of your Labours; for I don't find these ever appear but in *April*, and there seems to be no Possibility of forcing them out of their Season by Dung, because the Foundation of the Ground where they grow, must be solid, and they must have some Shelter from the Sun, as our finding them always in Woods seems to denote. This Removal of the Earth with the white Strings in it, is the same as we do in the Raising of Mushrooms; but I make it a Doubt, whether the stringy Earth of the Morilles will hold good for six or eight Months in a dry Room, as the stringy Earth of the Mushrooms will do; but it may do so for ought I know, and where we have Plenty of Morilles we may try it, by gathering or collecting it in dry Weather, and laying it in such a Room as may shelter it from the Rain, and at the same Time admit the Air till it is quite dry; and, after that, to keep it in a dry Room, but without a Fire till we use it. In my Chapter of the Mushroom, it happen'd by some Accident that the Use of such Earth with the white Strings chang'd to be omitted, and since I publish'd that Book, I have had so much Experience in the Growth and Culture of the Mushroom, that I believe it will not be displeasing to my Readers to give them a farther Account of the Matter: I have mention'd, indeed, a Way of making of Mushroom-Beds; but I have since seen and consider'd those excellent ones in *France*, which produce Mushrooms all the Year about, and am therefore at present more capable of giving Instructions upon that Head than I was before. I have in my New Improvements given an Account of the Figure of the Mushroom-Bed, that it should be made ridged on the Top like an

Afs's

Ass's Back, or lye sloping like the Ridge of an House, which is necessary if there should happen very great Rains; for by this Fashion of the Bed the Rains will run off the easier, and the Bed will lye much dryer than if it was to lye flat. And this ought chiefly to be consider'd in the raising of Mushrooms, that our Bed should lye dry, because the white Fibres or Strings which are found in the Mushroom Earth, are very subject to rot by much Moisture, and then our Crop will come to nothing. The *French* Method of making Mushroom-Beds is, to prepare a Parcel of Horse-Dung, or the Dung of Asses and Mules, and after it is well clear'd from the Straw or Litter, let it be toss'd up in an Heap in a dry Place, to remain for fifteen Days; then mark out your Beds, each about three Foot wide at the Bottom, and of any Length: The Beds should run parallel with one another, leaving narrow Paths between them; especially when we make Beds for Winter Use, many of them should be made together, for the greater the Body of Dung is, the longer the Beds will remain warm, and they will be the longer productive. Before we begin to lay on the Dung, we must at each Corner of the Beds set in Sticks, and making them meet at the Tops, tye them together, so that the two Sticks at each End of the Bed, and the Ground which makes the Base, form an Equilateral Triangle; these serve as Guides to work the Bed by, as may be seen in the Figure, where A shews the Sticks, and BB the Height we ought to raise the Bed at the first making. In the laying the Dung for the Bed, it must be beat and press'd very close with a Fork, working the Sides sloopwise, as the Sticks BB direct; when we have raised the Beds half their Height, cover them

them with loose Litter from the Stable, and so let them remain for fifteen Days : As soon as this first Part of the Bed is made, toss up a fresh Parcel of Dung as before, and at fifteen Days end finish the Bed, by working on the Dung as I have directed before, and then presently cover the Sides of the Beds with fine light Earth an Inch thick, beat a little down with a Spade ; and then break some of your Mushroom Earth, with the white Strings in it, into small Pieces, and stick them into the Earth on all Sides of the Bed ; or if the Mushroom Earth happens to be broken to Powder, we may sprinkle it among the Mould that we lay on the Side ; then toss up loosely some warm Litter from the Stable, and cover your Beds with it about eight or ten Inches thick, and sprinkle it pretty well with Water. These Directions being well observ'd, the Beds will begin to work in about a Fortnight's Time, and you may then gather Mushrooms every Day in great Plenty. We may see the Form of a Bed full made at A 2 ; this should be very exactly imitated, for I have known several Beds have fail'd, or have not brought half a Crop, when they have been made round or flat at the Tops. When you make Beds for Summer use, dig Trenches for them about ten Inches deep in the Ground. When the Litter grows cold, get fresh from the Stable ; I have known some that have us'd clean Straw instead of Litter, but their Beds were often idle. These Beds, with good Management, will continue to bear Mushrooms indifferently for several Years. Thus I shall leave the Culture of the Truffle, Morille, and Mushroom, to the curious in Gardens to be put in Practice.

But

But I cannot leave this Subject, without acquainting my Reader of the Method which is generally us'd in teaching of Dogs to hunt for Truffles. The best Sort of Dog for this Use is the *Spanish* Pointer, but a common Spaniel will do, if he be taught while he is very young. This must be done at the Season when the Truffles are ripe, by carrying him fasting every Morning to a Trufflery, and giving him a Truffle to eat after the outward Coat is par'd off; and then feeding him with some Meat, or other Thing which should be carry'd out on Purpose for him; but especially let him see you take the Truffle out of the Earth, and even the other Meat likewise, and you will soon find that he will be brought to your Purpose, so that no Trufflery can escape him; but then, when he is once taught his Lesson, he must be carefully ty'd up, or else he will destroy more than he will gain you. The Expence of Truffles, perhaps, in teaching him, may be two or three Pounds, but what he will then discover will soon answer his Learning.

Since I wrote the above Account of the Truffles, I have met with a Letter in the *Philosophical Transactions*, written by Dr. *Tankred Robinson*, wherein that worthy Gentleman acquaints us, that Mr. *Hatton* first discover'd the Truffle at *Rushton*, Anno 1693; that they are most tender in the Spring, tho' after Showers and sultry Weather, they may be plentifully found in the Autumn; but, in a particular Manner, it is related in that Letter, that Mr. *Hatton* observ'd Fibres at them, which he gives a Figure of, and I have copy'd from him, and added to my Figure,
Plate

Plate IV. and tho' I have not yet observ'd any Fibres at the Truffles which I have seen, yet, perhaps, there might have been Fibres at them when they were growing, and thro' their extreme Fineness might be broke off when they were gather'd; but I think to examine the next I find, by taking them up with the Earth about them, and putting all together gently in a Bason of Water, that the Earth may softly fall from them.

Of the Situation of the Flower-Garden.

AS I have been very particular in my *New Improvements* about the Culture of Flowers, I think it necessary to say something concerning the Situation of a Flower-Garden.

The Piece of Ground which we allot for this Use, ought to be well shelter'd from tempestuous Winds, and yet enjoy the Sun; for this End, I prefer Hedges of such Trees as lose their Leaves in Winter, because from the Fall of the Leaf to the Middle of *April*, they are naked, and do not hinder the Sun from influencing the Ground; but as a Flower-Garden is generally a small Piece of Ground, so, if it was to be fenc'd with Walls, then there would be eddy Winds, which would help to blight and destroy our Flowers. When I speak of a Flower-Garden, I mean such a Spot as is necessary for our choicest Flowers, and to try such Experiments in as relate to their Improvement; this Garden, therefore, should be fenced from the publick Garden, that it may be safe from indiscreet Hands, which do not know the

the Value of a good Flower, nor the Advantage which may arise from a good Experiment.

This Piece of Ground should, if possible, lye near the Green-House, because it may serve to set our exotick Plants in, after our principal Show of Flowers is over; and besides, all our Rarities will be there together, and the Gardener will more readily take Care of them, than if our Curiosities were straggling in different Parts of the Garden. This Garden ought to be dispos'd in Beds, for the Reception of our fine bulbous Roots, and our Seedlings of Auricula's, Polyanthos, and the Seedlings of bulbous Flowers: The whole should consist of a light Soil; even the Alleys should be regarded as well as the Beds; for a noisome Vapour coming from the Alleys, may undo all our Care in the Preparation of our Beds. If we are situate upon a Clay, we must by all means avoid digging into it, but lay a good Quantity of light Soil upon it, as well where our Alleys are to be, as where we design our Borders; what I call a good Quantity, is half a Yard thick, if it can be done, and the best Part of it skreen'd. When this is done, I think Edgings of Box are preferable to Border-Boards; for Box is continually increasing in Value, while Border-Boards are decaying.

Remarks on the Guernsey-Lilly.

AS the *Guernsey Lilly* is esteem'd one of the most beautiful Flowers of the Garden, and is now so much in Request, that it is daily sought after

after by all Lovers of Flowers; insomuch, that a learned Physician has thought it worth his while to give the World a large Volume on that Subject; I have thought fit to enlarge upon the Method of its Culture, and to remark some Particulars in that Flower, which yet have not been taken Notice of by any Author.

I have this Year had a very particular Opportunity of observing several hundred Roots of the *Guernsey Lilly* at Mr. *Sutton's* Coffee-house in *Aldersgate-street*, to whom they came directly from the Island, and with them some of the Earth they grow in. Mr. *Sutton*, who is very curious in Things of this Kind, observes, that these Roots ought to be planted very shallow, because many of the Bulbs which came to him, were near two Thirds cover'd with Moss, so that consequently a very small Share of those Bulbs were bury'd in the Earth; 'tis observable also, that the Fibres or Roots which proceed from these Bulbs are perpetual, and that the Growth or Appearance of this Plant above Ground, is about seven Months in the Year; and that during the Season that it disappears, one may remove the Roots from one Place to another, without doing them any Injury. Again, it is to be remark'd, that from the Time the Leaves fade till about the End of *August*, the Plant is in a State of Rest, like some of the Sleepers, as we generally call them; I mean such as the *Hedg-hog* or *Urchin*, *Bat*, &c. or among Plants, the *Narcissus*, and many other Bulbs. We are also to observe, that in this Flower, as well as other Bulbs, the Flower is actually existing in the Bulb a whole Year before it appears above Ground;

Ground; and that the blowing Roots remain always longer without shooting than the Leaf Root: The Leaf Roots generally put out their Leaves a Fortnight sooner than the flowering Roots produce any Thing; and it is also to be observed that the common Remark which we have hitherto look'd upon as a Rule for distinguishing blowing Roots, viz. the bringing of six Leaves the Year before Blossoming, is not to be any longer look'd upon as infallible, for this Year has plainly demonstrated the contrary in many Places; however, we must have so must Regard to the six-leav'd Roots, that we may reasonably conjecture, that they are in good Strength, and it has been observ'd that they have blossom'd the Year after they have shewn six Leaves; but my Observations this Year and the last, satisfy me that it is doubtful; but we may add, that the Roots which bring only two or four Leaves, are certainly too weak to flower; and there is one Thing more which I cannot help taking Notice of, which relates to this Plant's first coming into the Island of *Guernsey*, which was told me by *M. de St. Marets*, a very curious Gentleman of that Place: He says, That in his Grandfather's Time a Ship from *China* came in there, when some of the Sailors gave a Parcel of these Roots to a Person who then kept a publick House; This Gentleman tells me, that from thence came the whole Stock that is in the Island, and that the Place is now in Being, close by the Sea. This Story differs, indeed, from that which we have had of a Ship's being cast away, and the Roots swimming to the Shore and there taking Root; but I think this traditional Account of *Mr. de St. Marets* is the most probable of the two. It is remarkable, that the Soil which came with *Mr.*

Sutton's

Sutton's Roots, was a sandy Loam mixt with Sea Sand and broken Shells. From the whole we may learn, that the Bulbs should not be put in the Earth above half their Height. Again as to the Soil, we are taught to give this Root a free open Earth. I may take Notice here, that the Height of the Flower Stem, if the Plant stands in the open Air, will be about a Foot, and if it happens to be set in a Room, or in a Glass Case, or Stove, where the Air does not reach it with Freedom, it will sometimes be near two Foot high; but then it will be weak, and the Colour of the Flowers will be paler when it is confin'd, than when it has the free Air.

Of the extraordinary Vegetation of the Chaddock Orange, whereby the Necessity of Ripening Juices in Plants, to make them fruitful, is consider'd.

I Have taken Notice in this and my other Writings, that while the Juices of Plants are green or undigested, such Plants shoot vigorously into large Branches without any Shew of bearing Fruit; but, on the contrary, when the Sap of a Plant becomes more ripen'd and sedate, that Plant will produce smaller Shoots, which will set for Blowing or Fruit-bearing. As to the Consistency of the Juices in the vigorous shooting Plants, and in the slow Shooters, or those which are come to Fruit-bearing, it is in the first like the most fluent Liquid in Comparison to the second, which is more dence or thick, as if it had Gum mix'd with it; when, therefore, we observe

observe vigorous growing Plants, and the Reverse of them, we may know that the Juices which are necessary for the good nourishing of a Plant, must be thin and watry, and the Juices requir'd to render a Plant fruitful, must be of a less active Nature. I am the more particular on this Head, because it is impossible for any one to prune a Tree with any tolerable Success, unless he has regard to these Considerations: This, however must be always consider'd with my Doctrine of the Circulation or Sap in Plants, whereby it appears, that when any one Particle of Sap happens by extraordinary Heat to be forwarded in its Motion, every Particle of Sap contain'd in the Vessels of the same Plant, will also be quicken'd and become more lively; so that the Juices in the whole Plant will move alike in every Part. Instances of which we find in the Trees planted against my late invented Firewalls, and the Pales which I have directed for forwarding the Ripening of Fruits by the Heat of Horse-Dung, in both which Cases the Trees that are nail'd to them will begin to sprout in two or three Days after the Application of the Fire or the Dung, at such Places, or in such Branches as happen first to receive the Heat, altho' they were before in their State of Rest, as I call it, that is, when their Juices are less active by the Rigour of the Winter Season, such as the Blood in those Animal Bodies which sleep all the Winter; and these Animals also, like the Plants I mention, while they are in their most solemn sleep, will awake and recover their vigorous Motion, if we bring them before the Fire: In which Case, tho' the Rays or Points of Heat do not every where equally

fal upon the Object, yet one Part of the Animal being sufficiently warm'd, and the Juices in that Part made more active than the rest, by Means of the Contact between Part and Part, will also be render'd as fluent as the first. So, I say, when one Bud of a Plant, by extraordinary Heat is made to germinate, the whole Body of Juices in the same Plant, must consequently become as active as the Juices in the first Germinating Bud. So the Circulation of Juices in Plants may best be understood by comparing it with the Circulation of Blood in Animals: In which it is to be remark'd, that the Circulation is sometimes quicker, and sometimes slower, according as the Plants or Animals are influenc'd more or less by Heat; and that there must be some Degree of Circulation continually in Plants and Animals is certain, as Life in either cannot be maintain'd without it; for as soon as the Juices cease to move, so soon does the Body that contains them, tend to Putrefaction: But however the Juices in Plants are thicken'd by the Winter's Cold; yet we have many Instances which prove that they do not lye still at that Time, as may be observ'd in such Evergreen Plants as are grafted upon those which drop their Leaves in the Winter, and shoot even in the most severe Weather.

But we must take Notice in the next Place, that there is a Difference between the Juices in Plants which are thicken'd by Cold, and those which are digested and thicken'd by Heat; but yet neither of these Kinds of Juices, either by the most extreme Heat or Cold of our Climate,

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Climate, provided they are residing in natural Plants of our own Country, are subject to become fixt or incapable of acting and circulating in their respective Bodies; tho' Plants from the hottest and the very coldest Climates, when they are cultivated in our Latitude, are subject to have their Juices quite fixt, either by the too great Cold, or too great Heat of our Climate, and in that State perish; for whenever the Juices become perfectly fixt in any Plant, 'tis without Recovery; but to prevent this in the Exotick Plants which we cultivate, it is necessary to provide Green-Houses or Stoves for the better defending the most tender Sorts from the Severity of our Winter Weather, and to provide likewise a necessary Defence for such Plants as come from the coldest Countries, that their Juices may not be too much thicken'd by the too great Heat of our Summers. To shew the Possibility of fixing fluid Bodies by Heat, the White of an Egg, which is viscous, is an Example; and of rendring such Bodies as consist of oily or watry Parts more fluid, it is done by Heat; I mean such as Bees-Wax, Oil, &c. which are fixt by Cold, and made fluent by Heat.

This being premis'd, I shall proceed to give an Account of an extraordinary Phænomenon in the Chadock Orange, which I observ'd this Year at Mr. *Whitmill's*, which may serve to prove what I have said above concerning the Difference between the Juices which make a Plant shoot vigorously, and those which are proper to render a Plant fruitful. About the beginning of *April* Mr. *Whitmill* receiv'd several Fruits of the Chadock Orange from *Barbadoes*,

some in a State of Ripeness fit for eating, and others that were rotting, which, however, were not useless to him, because of the Seeds which were still fit for planting. These Seeds, as well as the others in the sound Fruit, he sets in Pots in *April*, and the *July* following several of them began to shew Blossoms on their Tops, which explain'd themselves in *August*: This Novelty put me upon a particular Enquiry, whether these flowering Plants were raised from the Seeds of the eatable Fruits, or the rotten Fruits; which fortunately Mr. *Whitmill* remember'd, and in a particular Manner observ'd to me, that they were taken from a Fruit which was so rotten, that its Contents were almost turn'd to Water: In the mean while it was observable, that the Plants whereon these Blossoms appear'd, were not near so vigorous as those Plants which were rais'd from the Seeds of the less rotten Fruit: This occasion'd me to make the following Remarks, *viz.* That, according to my former Observations, when the Juices of a Plant are well digested, its vigorous Growth is restrain'd, as appears by the blowing Plants that were rais'd from the Seeds of the very rotten Fruit, and were already in a State of Germination before they were planted, as it is common to observe Seeds already sprouted when we open rotten Lemons; I say, when Seeds happen to be thus set in Motion while they are in the Fruit, and receive their first Impression from full ripe or digested Juices in the rotten Fruit, then it must be of Necessity that the Plants rising from such Seeds must immediately come to bearing; while, on the other Hand, such Seeds as are taken from a ripe, or even a rotten Fruit, and that have not sprouted in the Fruit, but receive their first

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first Nourishment from the Juices of the Earth, such Plants will shoot vigorously by the Nourishment of the raw Juices, and the more vigorously they are made to shoot, so much longer Time they will require for the digesting of their Juices, or coming to a Fruit-bearing State; but then it seems reasonable to conjecture, that when the vigorous Growth of a Plant begins with its first Germination, it will be more likely to endure and be lasting, than such a Plant as, at the first setting out, is fed only with fully digested Juices, and comes to bear Fruit before its natural Period. But it seems it is not only at Mr. *Whitmill's*, that this extraordinary Accident has happen'd, for I am credibly inform'd, that the same Thing was observ'd in Dr. *Monroe's* Garden at *Greenwich* some Years ago.

Here it will be necessary to offer a Word or two concerning the Ear-leaves, or the Lobes in a Seed, and their Functions, to prevent any Objection to the Doctrine I have laid down, when I cannot be present to answer it myself. By the Lobes or Ear-leaves of a Seed, are understood the two first Leaves that appear of every Plant rais'd from Seed: These, while they are folded up in the Seed, inclose the Plantula or little Plant, and serve to find it Nourishment from the Moment it begins to germinate, to the Time that its Roots have sufficiently taken hold of the Ground to give the Plant Nourishment from thence, and then these Lobes, being no longer of Use, decay and drop off. Now these Lobes of the Seed, when they lye in the Fruit, will imbibe such Juices as are fully qualify'd to feed the young Plant, and make the first Impression on it what Kind of Juices it

ought to draw from the Earth, when it comes to shift for itself; or in other Terms, these Lobes or Ear-leaves give the young Plant its first Stamp, which it is oblig'd to follow ever after. Now, in the Case of the young flowering Chadock, the Ear-leaves were under a Necessity of imbibing such a Share of the digested Juices of the rotten Fruit, as overpower'd their natural growing Juices; and so, distributing of them to the Embrio, or little Plant, at its first Germination, it was render'd more suddenly productive, than capable of vigorous Growth.

Of the Bark-Bed, and of the Ananas or Pine-apple, the Guava, the Coffee-Tree, the Bananas, &c.

THE Tanners Bark is of great Use for making of Hot-beds, and as the Secret of its Management is necessary in the Conservation and Education of all such tender Exoticks as are brought to us from the hottest Climates, I shall here give the necessary Directions for making a Bark-bed,

There must first be prepared a Place about four Foot wide, and about ten or twelve Foot long, to be inclos'd with Brick-work about three Foot high: This brick'd Part is generally made under Ground, if it can be kept dry; for where Waters lye near the Surface, they occasion the Bark to burn, as often as they come to it; and so when the Waters rise near the Surface, we must make our Brick-work above Ground,

Upon

Upon the Top of the Walling may be set a common Hot-bed Frame, or a Frame of the same Nature, four or five Foot high at the Back, according to the Height of the Plants we are to set in it.

If we make the Frame of any considerable Height then it is adviseable to make the fore Part, or Front of the Frame of Glass in Panels, to be taken out when it is necessary to give the Bed Air in wet Weather, when the Glass Lights on the Top cannot properly be open'd; one of which Kind of Frames I directed to be made at *Vaux-Hall*, when I order'd the making of the forcing Frames, for forwarding the Ripening of Fruits; but I shall here give a Figure of it, as well as of some Stoves which are useful for these tender Plants in the Winter; for this Frame is design'd only as an Help to the most tender Plants in the Summer, that is to say, when we raise Seeds, or else, when the Plants are young: We may use this Frame from *April* to the Middle of *October*, and then they may be set into the Stoves,

I am the more particular on this Account, because I now find that my former Writings concerning Coffee, have brought that Plant to be familiar in our *American* Plantations, I mean in the Island of *Barbadoes*, where, at present, there is a great Number of Plants in a Fruit-bearing State, from whence some have been brought to the Royal Palace at *Hampton-Court*, in a prosperous Condition; and I doubt not but the Plant for its Beauty and Curiosity, will be much coveted by all Lovers of Gardens with us, especially

ally since the same Expence, in Point of Culture, will serve for the Education of all the choice Fruits of the hottest Climates.

But there are some who are afraid of the Expence of these Things, believing they will be a considerable Rent-Charge: If the Expence is to be in the Tanners Bark, every one knows it is much cheaper than common Horse-Dung, as it will keep a good Heat from *February* to the End of *August*; and the Fire which is requir'd to be kept in the Stoves, during the Winter, cannot be very considerable; one Fruit of the Pine-Apple or Ananas, to be sold, would pay the Expence; and these Conservatories will keep the Ananas, as well as the Coffee, and the Bananas or Plantains, or the Guavas or Mango; or, indeed, any of the Fruits which grow between the Tropics.

The Green-House, which I have describ'd in the foregoing Work, is of great Use; but as it is not in the Power of every one to erect, I think it will be necessary to describe some Stoves of smaller Size, which will be of little Expence; for the Building of which I have given sufficient Direction to Mr. *George Eaton*, Bricklayer, in *Miles's-Lane*, near the *Monument*, *London*, who has already built many Stoves of extraordinary Use, some of which I shall mention when I explain the Plate Numb. V. and VII.

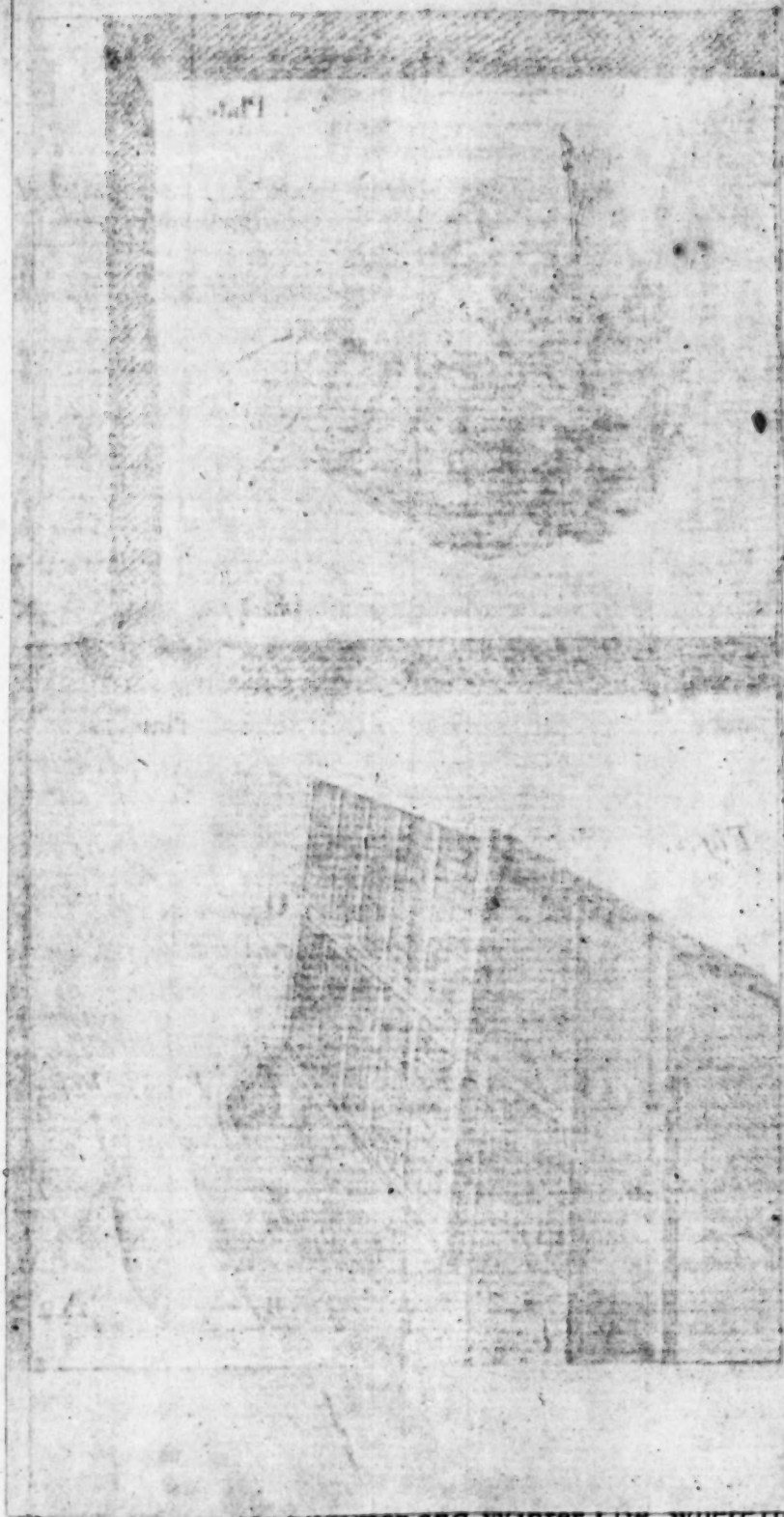
In the Affair of the Bark-bed it will be necessary to observe, that the Lights or Glasses in the old Way, always had the Bars, to which the Glass was fasten'd, within Side; and, in that Manner, were very destructive to the Plants
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that stood under them; for the Dew or Steam of the Bed, by being condens'd, when it comes to the Glasses, will gather into Drops, and by Means of the Communication between the Bars and Glasses, those Drops will fall upon the Plants, and rot them; but to prevent this Disorder, or the old Practice of turning the Glasses of Hot-Beds every Morning, Mr. *Whitmill* now puts all his Bars on the Outside, leaving a convenient Space for the Rain Water to pass between them and the Glass; and I observe, that whatever Dew is condens'd in the House, or Bed, runs gradually down the Glass without dropping; so that all the Plants which are inclos'd in such Beds, or Stoves, will be out of that Danger which too frequently has destroy'd our chiefest Curiosities.

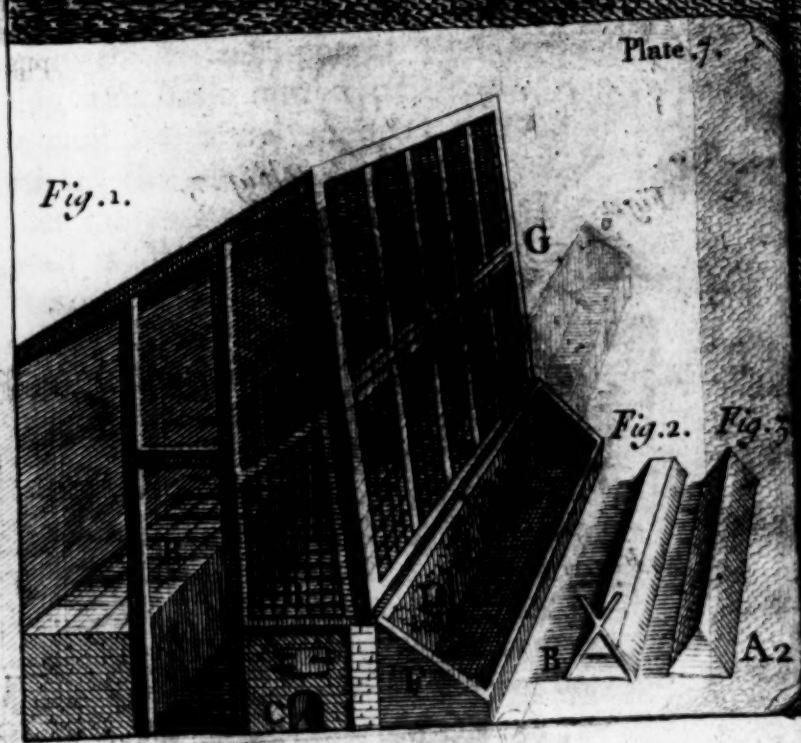
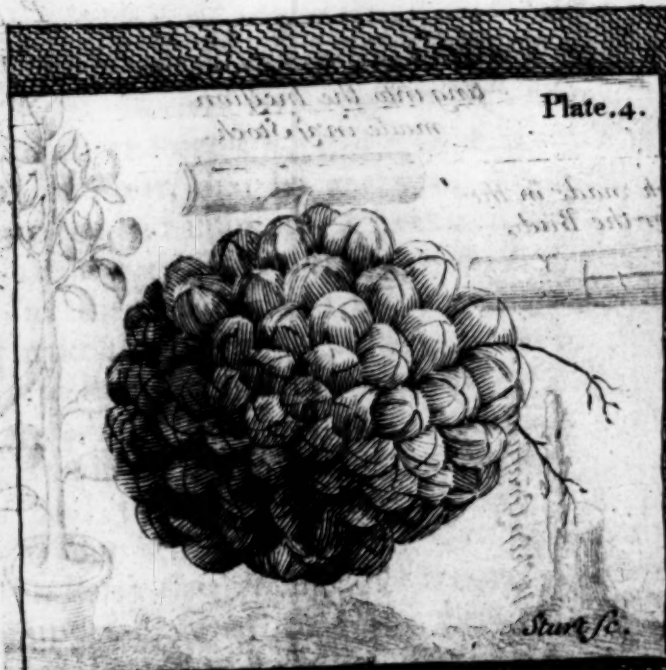
In the next Place we come to speak of the Tanners Bark, and how to use it. This Bark is such as the Tanners have quite done with, and should be had into our Garden soon after it is taken out of the Tan-vats, and then toss'd up to let the Water drain from it, and turn'd once or twice to make the Parts of an equal Moisture as near as possible; for else, when we make the Bed, it will work unequally, which is a great Fault; we must then sift or skreen our Bark, that it may be of one Fineness at the Top, and reserve the coarse Part for the Bottom of the Bed. When this is done, we may spread a little Rubbish at the Bottom of the Case of Brick-Work, and some fresh long Dung from the Stable to lay upon that, in all to make about a Foot thick when the Dung is press'd down. This Preparation is for two Uses, the first is to give a quick Passage to the Wet which
the

the Bark will receive by watering the Plants set in it; and the second is, that the fresh Dung will create an Heat, and set the Bark to work which is to be laid upon it. I have already observ'd, that we must lay the grosser Parts of the Bark at the Bottom, and the finer at Top, when we make the Bed; the Reason is, that the larger, as well as the smaller Parts of the Bark will heat, but in different Manners, *viz.* the larger Parts will be longer before they are heated through, and then would be too hot to lye near a Pot, but will serve to communicate Heat to the finer Parts that should lye above them; and the upper Part of the Bed being made of the finer Parts, will be constantly regular and gentle in their Heat, and therefore much more proper to set our potted Plants into: In the laying this Bark into our Case of Brick-Work, we must be careful to press it together pretty hard till the whole is filled to the Top; and then set on your Frame, and put on the Glasses about a Week afterwards, which will soon after come to be fit to set our Pots upon; but be not too hasty to plunge them into it, lest the Heat be over-much; I reckon about ten Days after you have set your Pots upon the Bark, you may venture to plunge them, and in such a Bed, if it be made in *March*, there will remain a sufficient Heat to the End of *August*, or till the Middle of *September*. *Note*, when your Bed begins to mould at the Top, the Ferment is gone, and the Heat lost; but you may renew it again by turning the Bark a Foot deep, and giving it a few Sprinklings of Water.

Explanation



made both for Summer and Winter Use, where the
Bark



A Bud prepared for putting into the Incision made in y^e Stock.

The Mark made in the Bark for the Bud.



Cleft Grafting.

Whip Grafting.

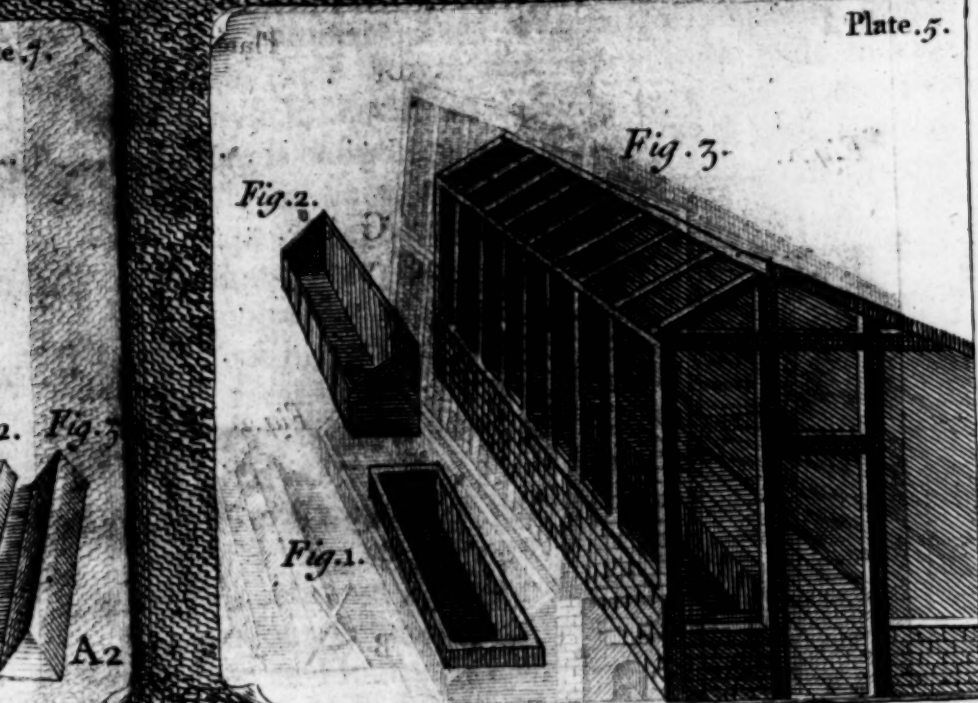
Budding or Inoculating.

Inarching.

Fig.2.

Fig.3.

Fig.1.



made both for Summer and Winter Ue, where the Bark



Explanation of Plates V, and VII.

Plate V. Fig. I. Shews the Case of Brick-Work, wherein the Bark is to be laid.

Fig. II. The manner of the Frame to be set upon it, with the proper Glasses in the Front, and at the Ends of the said Frame, for receiving the Sun at its first rising and till it sets, and also for giving Air properly in windy Weather.

Fig. III. represents a Stove or Conservatory for tender Plants, whose Glasses stand upright, and upon them are design'd other Lights to be laid sloping, the better to receive the Sun in the Summer: This is almost of the same Kind with those Stoves that were lately built in the Physick Garden at *Chelsea*, only this in the Figure is design'd about eighteen Foot high, for the Sake of some Plants which will grow tall, as the Papa-Tree, and especially the Bonanas or Plantain, whose Leaf alone will be three or four Foot long, and the Flower Stem, perhaps, ten Foot high, and so likewise the Mango will make a great Tree, and must have Room if we would have it bear Fruit; the Seeds of these, however when they come to grow, will produce Plants which will be more hardy, and in Process of Time, by the sowing of the Seeds successively, I doubt not but they may be so nearly naturaliz'd to our Climate, that the Shelter of a common Green-House will be sufficient for them. In this Glass Case I have made the Place for the Bark-Bed quite in the Ground.

Plate VII. Fig. I. Is the View of the Glass Case, made both for Summer and Winter Use, where the
Bark

Bark-Bed may be in the Middle, and the Fire Flues round about the House: The Place for the Bark-Bed is mark'd A, and the Course of the Fire Flues B B. The Place for the Bark is only to be used in Summer for our tall Plants; but in the Winter, when we use Fires, the Bark must be quite remov'd, and then the Hollow where the Bark lay, will serve for a Walk, and so the Tops and Sides of our Fire Flues will then be above Ground, and dry the Damps in the Glass Case, which too frequently rise in Winter.

But as our Glass Case will, in this Condition, afford but one Degree of Heat, so we must from thence conclude, that it will only be proper for Plants that come from one Climate, unless it is so alter'd that we can give Air to one Part, while we keep the other inclos'd, and then we may cultivate in the same House Plants requiring very different Degrees of Heat; but the Way to do this I have mention'd in my Description of the Green-House in the foregoing Work, and there is now a Sample of it in one of Mr. *Whitmill's* Stoves at *Hoxton*.

The Letter c denotes the Fire Place or Stoke-Hole, running under the Flue B, and thereby warming the Wall D; against which Wall may be planted Cherries, Plumbs, Roses, or such Fruits as will bear at four Foot high; by this Means the Fruits against the Wall D will be forwarded several Weeks sooner than those which depend upon the natural Season. In the Border E one may plant Strawberries and Flowers of various Kinds, and inclosing this Border with a Frame and Glasses F, we may bring them
to

to bear very early; and also by the same Means, the Strawberries are brought to bear Fruit all the Summer after, except only at the common Strawberry Season, when they hold a little Rest; this I observ'd this Year at Mr. *Whitmill's* at *Hoxton*.

The Letter G shews, that each Window or Glass is divided in two, that we may give Air as we please, and with more Safety, than if we were to open a whole Casement at once while the Weather is cold; so likewise, if we inclose a Part of our Glass-Case with Glass, I mean the first Flue B, which is over the Fire Place, and make it, as it were, a Stove within a Stove, only letting the Top reach as high as the Top of the lowest Casement at G, then, by keeping close all the Range of lower Casements, the Plants within that small Stove will be kept in a very great Heat, while all the Plants in the other Part of the Glass Case may have Air from the upper Casements. Mr. *Whitmill* of *Hoxton* has a very good one of this Sort.

Fig. II. represents a Mushroom-Bed half made, A the Point where the Sticks meet, which are to guide the Fashion of the Bed; BB shews the Height of the half-made Bed; A 2 at Fig. III. shews the Figure of a Mushroom Bed finish'd.

In a Word, in these Directions we have the Bark-bed for training the Ananas or Pine-apple in the Summer, as also the young Coffee-Trees, the Melon Thistle, young Guavas, the Papas, and other Exoticks of the most tender Nature; and when some of these, with the Bananas or Plantains, are too tall for this Frame, we must have

have Recourse to a Bark-bed in the Stove for the Summer, and in the Winter make the Fires and keep them continually, removing then the Bark, and setting the Pots on Sand. This is what is chiefly to be observ'd for keeping and ripening the Pine-apple; for there is nothing more in the Culture of it, unless that about *August* you must take off the Suckers from the great Plants, and plant them singly in Pots, where they will soon take Root, if you give them gentle Waterings. The Pine-apple is likewise propagated by the Head or Crown of Leaves which grows on the Top of the Fruit, by setting it in a Pot as soon as it is twist'd from the Fruit. It is observable, that one of these Heads will bear a Year sooner than an Off-set or Sucker; the Reason is the same as I have mention'd before in the extraordinary Production of the Chaddock Orange, *i. e.* that this Crown is nourish'd by the ripen'd or well-digested Juices of its own Fruit, whereas the Sucker receives its Nourishment crude and raw from the Earth, and must have Time for Digestion.

Remarks concerning the Coffee-Tree.

NOW I have given proper Directions for the Bark-bed, and the Stoves which are necessary for keeping the Coffee Plant, I think it may be necessary to add a Word or two concerning the Improvement of it, which I have omitted in my other Works: The Description of it being already in my *New Improvements*, and in my Treatise of Coffee publish'd in the Year 1714, when I was in *Holland*; which, considering that I had at the same Time several thousand strange
Plants

Plants to examine, was as full as my Time would allow, and at that Time not any Person who had seen it grow in *Europe*, had written any thing concerning it; for it was towards the End of the same Year, when the States of *Amsterdam* sent the first Plant of Coffee to the King of *France*, that ever was seen at *Paris*; so that I am of Opinion Dr. *Douglass* had not seen the first Edition of my Treatise of Coffee, when he wrote his Botanical Dissertation of the Coffee-Berry, because in Page the 6th of that Work, that Gentleman says, "That Mr. *Bradley*, it seems, had "neither seen *du Jussieu's* nor *la Roque's* Memoirs, tho' publish'd six Years before he undertook to write upon Coffee:" And particularly, I imagine that the Doctor had not seen my first Edition of that Treatise, because in the same Page it is said, "That *Mons. de Jussieu*, in "his excellent History of the Coffee-Tree, read "in the *French Royal Academy* in 1715, &c." So that the Time when Dr. *de Jussieu* read his History of it, was the next Year after my Account of it was publish'd; but I shall proceed to remark some Particulars relating to its Culture, which yet are not made publick.

I have already given my Reasons, why I suppose it to be a Jessamine, and have in my New Improvements prescrib'd the Inarching of it upon the common Jessamine, as we do the Plant commonly known by the Name of the *Arabian Jessamine*, which I am persuaded will do very well, since every Day confirms me more and more that it is of that Tribe; however, I have heard from Mr. *Knowlton*, who was lately Gardener to Dr. *Sberrard*, that in the Doctor's curious Gardens at *Eltham*, he rais'd the Coffee-Tree, both by Layers and

and Cuttings; so that if there may be some Difficulty of raising it from the Berry, there will be none in raising or propagating of it these Ways. But there is one Thing which yet remains to be mention'd, concerning the Management of the Coffee-Tree, which I have only slightly touch'd upon in my New Improvements, and that is, the Necessity of washing the Leaves and Shoots about *June*, and even in *September* too: This must be done with a Sponge and Water, and if there is some Tobacco steep'd in the Water, I believe it will do good; for I find that the Leaves and Stalks of the Coffee-Tree are very apt to be cover'd about *June* and *July* with a Kind of Mildew, such as may be observ'd upon the Flower Stalks of Colly-flowers, which afterwards changes to little Insects that will poison the Plant; these, therefore, should be carefully wash'd off as soon as we discover them; and is what is very strictly observ'd by the Gardeners in *Holland*, not only in this Case, but in the Culture of every Stove Plant: They have People on purpose to clean the Leaves of their housed Plants, but more frequently the Coffee-Tree than any other, and there are no Plants that look better than theirs. I remember once that Mr. *Cornelius*, the curious Gardener at the Physick Garden at *Amsterdam*, set some Seeds of the Coffee in a Pot, which stood Abroad, and they came up, and made as good an Appearance as any of those that were rais'd in the Bark-bed.

The END.





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